The Chemical Age

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Industrial Chemistry in Canada

THE Canadian Chemical Convention, held at London, Ontario, which is reviewed by a special correspondent on another page, directs attention to some of the particular problems of the industrial chemist in that country and the U.S.A. and has served to remind us of the importance of the Canadian chemical industry. The vastness of the country, appropriately reflected in the length of the tour taken by their Majesties in traversing the width of the Continent, renders the holding of representative meetings a difficult matter. For this reason research papers are usually contributed direct to transactions, an unsatisfactory method because discussion so often generates interest and publicity and points the way to fresh advances; or at the best research papers are discussed before small and localised audiences. Not the least of the advantages of large annual meetings is the personal contact set up between members of the chemical profession, which oils the wheels of business and forges bonds of reciprocal regard that lead to mutual assistance and co-operation between chemists—a fact that is obviously well recognised in the drawing-up of the programme for the annual meetings in this country of the Society of Chemical Industry. The Canadian Chemical Convention was clearly a happy blend of technical and social events.

Canada is a young country with vast resources and that fact appears to make her somewhat over-prodigal of her raw materials. Dr. R. K. Stratford, President of the Canadian Chemical Association, drew attention to this fact and urged that far more should be done in the direction of conservation. It is perhaps natural that abundance of resources leads to waste in the winning and using of them. There are among pioneers many whose intention is to get rich quickly without regard for those who come after. They see wealth to be had for the taking, perhaps in agriculture, perhaps in mining coal from thick and easy seams. By taking what is before them in the easiest, which is almost certainly the most wasteful, method, the next generation is compelled to spend much of its time and scientific knowledge in undoing the harm that has been done, for example, in denudation of the soil, or in devising economic means of mining lean ores or perhaps of winning coal from thin and deep seams. Is not the moral that industrial development of every character should be planned economically and carefully right from the start by industrialists of wide vision, with perhaps Governmental collaboration. The world is in need of skilled economic planning in many directions and perhaps not least in opening up trade throughout the world to every nation so that none may go short in a world in which there is plenty for all. Through organisation of industrial effort we may attain an ever-rising standard of living in a world at peace. The consequences of unorganised competition are only too manifest throughout the world both on the small and large scale.

> *The sooner that there is a closer partnership between agriculture and industry, the sooner will many of the economic problems of our day be solved. . . .*
>
> —*William Gallay (in a symposium on the natural resources of Canada).*

The mention of planning and organisation brings to mind the highly significant remarks of the President of the American Institute of Chemists, Dr. R. J. Moore. These remarks serve as a warning of the perils of lack of organisation. He points out that chemists are being compelled in the U.S.A. to join a labour organisation before they can be appointed and "in some instances applicants for positions are asked for labour union cards before their applications can be considered." As if this were not enough, Dr. Moore points out that it may happen that a chemist may be employed in a laboratory but unable to go onto the plant because he is not a union operator and cannot therefore have anything to do with equipment. Such a state of affairs can surely only arise when chemists have not their own strong and all-embracing organisation that can see that the rights of its members are safeguarded in the light of their special knowledge and responsibilities. For a state of affairs even approaching that depicted by Dr. Moore to arise suggests that employers are unconscious of all the functions of the chemist. The trend seems to be in the direction of registration so that chemists may join a professional group that will be immune from labour regulations. It is becoming necessary in the States for the chemist employed in medicine and biochemistry to have his position properly defined by law. The addresses of the Canadian Chemical Convention certainly raised points of interest on matters similar to those with which chemists over here are concerned. Although there is little indication at present that chemists here will find themselves subjected to such interference as their American colleagues, it is interesting to see what *can* happen and to guard against any similar tendency.

NOTES AND COMMENTS

Canadian Chemical Industry's Steady Progress

PRODUCTION of chemicals in Canada last year showed a small decline from 1937, but the value was higher than in 1929 and was the second highest on record. Thus the gross value of production in the chemical and allied products group of manufactures in 1938 totalled $145,074,00, against $148,973,000 in 1937 and $138,545,000 in 1929. Between 1937 and 1938 the number of plants in operation increased from 754 to 774 and the capital employed from $161,165,000 to $161,331,000. New works opened last year included plants for the production of lactic acid, stearic and other fatty acids, and metallic naphthenates; Canadian requirements of these materials were formerly satisfied wholly by imports. The largest value of production for an individual industry last year was that of medicinals and pharmaceuticals, with paints, pigments and varnishes second; followed by acids, alkalies and salts; soaps and washing compounds; and fertilisers. Imports of chemicals and allied products into Canada were valued at $35,205,000 ($37,414,000 in 1937) and domestic exports at $19,496,000 ($21,667,000 in 1937). Exports to the United Kingdom were valued at $5,031,000 and purchases from the United Kingdom were valued at $6,947,000.

Oil in England

PART of Lord Cadman's speech at Monday's meeting of the Anglo-Iranian Oil Co., Ltd., was devoted to a review of the company's exploration work in England. He indicated the thoroughness with which that work was being undertaken and the fullest use which was being made of the aids of science and modern technique. He made a special reference to the striking of oil at Eakring, Nottinghamshire, on June 7. The oil, he said, was discovered at 1,914 ft. in a sandstone in the lower coal measures; the structure was an anticline of good size and closure. A production test was now in progress and he hoped for satisfactory results. Lord Cadman added that the discovery at Eakring heightened the potentialities of areas to the East over which the company holds licences. It sounds as though the discovery at Eakring may well prove to be one of first-rate importance in which case it would be of the greatest value in helping to displace imports of a vital material, the home supply of which is but a very small part of the country's total consumption.

Standard Specifications for Road Tars

THE lack of correlation between the properties of road tars as tested in the laboratory and actual road performance was emphasised by Mr. D. W. Parkes, of the Midland Tar Distillers, Ltd., in a paper on "The trend of modern road tar research and its anticipated influence on road practice," which he read before the International Road Tar Conference at Brussels last Saturday. He said that most standard specifications for road tars lay down limits of specific gravity, naphthalene content, and matter insoluble in benzene or other solvent, but the connection between these properties and performance under any given conditions had never been explained. "Specific gravity was probably introduced to exclude to some extent the more recent types of low aromatic tars, but when one remembers that bitumen itself is of lower specific gravity than most tars and consists mainly of non-aromatic bodies the requirement of a specific gravity limit without a proved practical basis is clearly unsound. Limitation of naphthalene is in much the same case. . . . The position is even more absurd with the third property—the matter insoluble in benzene or other solvent. Assuming for a moment that this insoluble matter is deleterious when present in quantities outside the limits laid down, there is no evidence to show that the insoluble matter derived from a high aromatic tar is of the same composition or properties as that derived from a low aromatic tar; in fact, there is considerable evidence to show that the quality of the insoluble matter differs markedly according to the type of tar from which it is derived."

Tar Specifications of the Future

MR. PARKES then described work which had been put into operation with the main object of correlating the properties of tar as demonstrated by laboratory tests, with actual performance on the road. He thought that if positive results emerged from this work the most important effect would be a complete change in the type of standard specification. He hoped that every item in future specifications would have a practical meaning. At present tars had to comply with certain arbitrary requirements of specific gravity, distillation range, insoluble matter, etc.; the only property which was deliberately varied to suit conditions of use was viscosity. He considered that in the future viscosity would be a small and unimportant item connected only with the handling of the tar before it was used and that the important items in future specifications should deal with setting time, quantitative loss on exposure, ductility of residue on exposure in relation to temperature, heating properties of the binder after exposure. In addition it would be necessary to specify reasonable stability at storage temperatures over long periods.

German Trade in Oils, Fats and Soaps

GERMANY'S home demand for oils and fats is still rising and is far from satisfied, so that there is, of course, little export trade in these commodities and stringent regulations are in force to reserve as much as possible for edible purposes. Exports of palm kernel oil, for example, fell from 6,184 tons in the first quarter of 1937 to 415 tons in the first quarter of 1939. The principal imports of oils and fats, including also soya beans, into Germany during the first quarter of this year were as follows, in tons (figures for corresponding period of 1938 in brackets): palm oil 8,002 (10,643); groundnut oil 3,211 (6,765); coconut oil, nil (406); olein, etc., 5,693 (4,652); castor oil, 1,516 (3,964); cottonseed oil 392 (472); soya beans, 246,223 (162,830); soya bean oil, 464 (127); tallow, 6,058 (6,787); whale oil unhardened, 10,806 (9,987); fish oils and seal oil, 13,983 (9,248). A few of the comparative figures for 1937 are of interest, namely: soya beans 143,429; soya bean oil, 1,286; and whale oil, 27,497. The total values of soap of all kinds exported, in 1,000 RM. were 2,783, as compared with 2,443 in 1938 (first quarter) and 2,744 in 1937. The very considerable increase in soya bean imports, nearly double of 1937, will be noted, and this, of course, much more than compensates for the fall in imports of soya bean oil since 1937. Whale oil arrivals were much less than half those of the corresponding period of 1937, and are indicative of the remarkable development of Germany's own whaling industry; although they do not tell the whole story of this development. Germany's production of whale oil, in fact, for the season just ended very much more than makes up for the drop in imports, and the hardened oil is now used in very large

quantities for her great margarine output. In the soap trade, although the various individual categories, such as soft, hard, toilet, powder or flake, mostly showed a substantial increase in quantity—about 50 per cent. on the average over those of the corresponding period for 1937—there was an appreciable fall in values for most of these products in the export markets, so that, as will be seen from the total values given, figures for the first quarter of this year are about the same as for 1937.

Carcinogenic Chemicals and Cancer Research

AT the opening of the Imperial Cancer Research Fund's new laboratories at Mill Hill on Tuesday, Sir Frederick Gowland Hopkins spoke on cancer research and some of the recent developments which had been made. In the course of his address he said that it had long been known that prolonged contact with tar could produce cancerous growths; but now the combined efforts of the pathologist and the organic chemist had shown that it was certain specific substances in tar which were alone responsible for the effects. The exact constitution of these substances was known, while others related to them had been artificially synthesised and their graded capacity for inducing cancer carefully determined. Among them were some which were remarkably active. The interest inherent in such facts was increased by the circumstances that these cancer-producing substances, though differing from them in details, were akin chemically to substances natural to the body—for instance, to the sex hormones. The power to influence morbid growth could be a property inherent in definite chemical substances. Such objective facts as those, he continued, should encourage equally objective and sane thought about a malady which had been viewed in the past from a standpoint which was almost that of superstition.

The Houdry Cracking Process

(From a Special Correspondent in France)

INFORMATION on the Houdry process for the catalytic cracking of crude oil and its conversion into a high octane number motor fuel has been released by the Société Française pour la Fabrication des Essences. Although the process has been in industrial use in the United States for almost ten years, the method has been kept secret.

The process is described as follows. Crude oil is run first through heat exchangers in which it is heated by the cooling residual fractions of the process. When preheated, the oil passes to a fractionating tower where the light gasoline, naphtha, kerosene and light gas oil are removed. The residue, at 550° F., goes to a still in which it is heated up to 880° F. before passing into a vaporiser. Here the oil is vaporised preparatory to passage through the catalyst cases and the tar bottoms are removed and utilised to heat incoming crude.

The vaporised fraction passes through the catalyst cases at 850° F. and leaves them at the same temperature to pass through a heat exchanger and then to the synthetic oil fractionating tower where the oil is separated into its components. Here the gasoline is drawn off, leaving a residue of furnace oil and of heavy gas oil, each being run separately through heat exchangers before being stored. The catalytically prepared oils can be further cracked, though with a lower gasoline yield than would be the case were virgin crude used. Production is higher, however, than it would be by the ordinary thermal cracking process. Butane produced in the process of cracking is polymerised by catalytic treatment in the liquid phase. The polymer is fractionated out and forms a stock for hydrogenation to isooctane used for addition to the gasoline produced in the cracking process.

Chemical Matters in Parliament

The Medicine Stamp Duties

ON the motion that Clause 7 (Repeal of Medicine Duties) stand part of the Bill, Mr. Graham White said that the reasons for abolishing the medicine stamp duties were inadequate and that the situation which would result from the abandonment of the duties was giving rise to considerable apprehension in many quarters.

Sir A. Wilson said the desire to defer the repeal of the duties was an expression of the conviction that their removal would, unless other duties were substituted, facilitate the expansion of a trade which urgently needed control. This was now the only country in Europe, almost the only country in the world except the United States of America—certainly the only part of H.M. dominions—in which patent medicines and proprietary remedies were not taxed. Was it to be supposed that no possible scheme could be evolved by the Commissioners of Customs and Excise for the reasonable taxation of medical preparations? He was assured that the Chancellor had not discussed the alteration with the interests concerned. He was assured that there was no responsible body in the drug trade who would not prefer a revised tax to a repeal, and several trade organisations had made that quite clear.

Dr. Haden Guest said that the repeal of the duty would be a grave injustice to the public, although it would be a great advantage to certain large interests. If the proposal was persisted in the Chancellor of the Exchequer would have thrown open the whole gamut of fraudulent patent medicines to every person, however young. It was a scandalous proposal, and if persisted in should be accompanied by an unequivocal undertaking that the Government would bring in legislation to control the patent medicine and patent instruments industry.

Mr. Alexander said that the real remedy was not to reimpose the duty that the Chancellor of the Exchequer wanted to repeal, but to require that when the formula of a secret remedy was not disclosed to an independent and qualified body that commodity should be banned.

Sir J. Simon said he did not agree that medicines in general should be taxed. That was an astonishing proposition. When he turned to the Select Committee's report in the hope of finding an alternative solution he was greatly disappointed. The Committee's view was that there should be imposed a duty on a wide range of medicines and remedies—practically all except those made up on the prescription of a doctor.

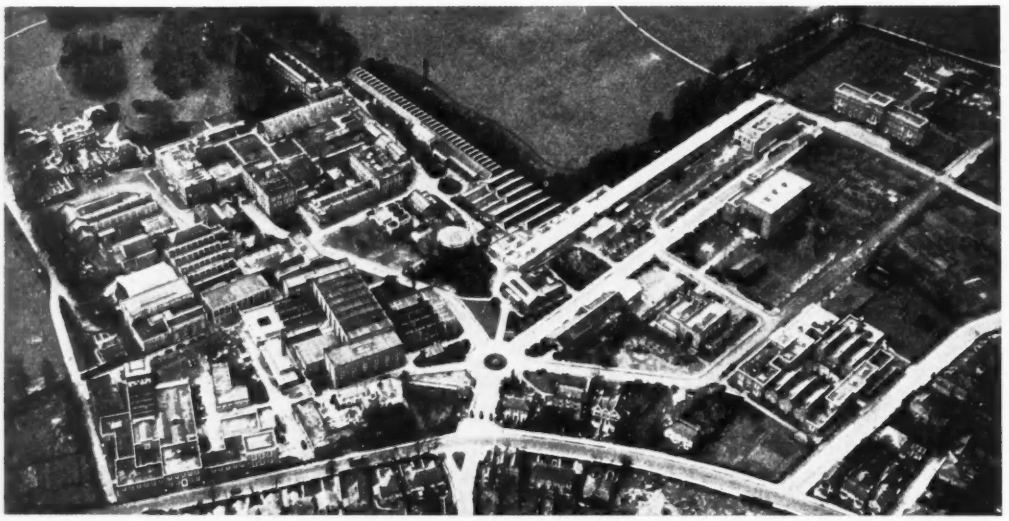
The Ministry of Health had said that they did not think that the repeal of the medicine stamp duties should have an adverse effect on the health of the nation. But there was no doubt that a very large number of members agreed with the recommendation that there should be some new mode of treatment in this matter combined with a repeal of the duties. He was willing to maintain these present duties for another year, but the Government must in the interval see whether it was possible to examine the position both as regarded the possibility of this or any other tax, and as regarded the aspect of public health.

SODIUM PYROSULPHITE FROM SO_2-CONTAINING FLUE GASES

The obtention of sodium pyrosulphite from waste gases containing small amounts of sulphur dioxide has been achieved by Ahrap-Simonova (*Jour. Appl. Chem. U.S.S.R.*, 1939, *12*, 346-351; 351 in English). When a flue gas containing 0.5-0.8 per cent. of SO_2 is passed over moist solid sodium carbonate monohydrate, a product is obtained which contains 87 per cent. of $Na_2S_2O_5$, 3.3 per cent. of Na_2SO_3, and 11 per cent. of Na_2SO_4. It is essential that the carbonate be moist. This result was obtained both on the laboratory and semi-technical scale in a continuous treatment plant. An addition of 0.2 per cent. of phenol on the weight of the soda ash decreased the amount of sulphate obtained to about 6.5 per cent.

NATIONAL PHYSICAL LABORATORY

Annual Inspection Day



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ON the occasion of the annual inspection of the National Physical Laboratory by the General Board some 1,500 technical representatives of industry from all parts of Great Britain met at Teddington on Tuesday to review the work of the Laboratory and the advances made during the year. The visitors were received by Sir William Bragg, O.M. (the President of the Royal Society, and Chairman of the General Board), Lord Rayleigh (Chairman of the Executive Committee), and Dr. C. G. Darwin (Director of the Laboratory). Special exhibits demonstrating the work were staged in the departments, and the laboratory was entirely thrown open to the visitors.

In the Physics Department there was an exhibit concerned with the radium content of materials of low radio-activity. The problem of measuring the radio-activity of feebly active materials, such as the water from certain natural springs, differs considerably from that of measuring powerful sources. The apparatus shown can measure the radium in a material even if it is only present to the extent of one ten-thousand millionth of a gramme, by making use of the radium emanation given off by the radium. The activity of the emanation is compared with that of the emanation from a known amount of radium, by means of ionisation measurements, in which the electrical conductivity imparted by the emanation to air is observed.

Measuring the Temperature of Liquid Steel

In an apparatus for measuring the temperature of liquid steel, devised at the laboratory, a thermocouple is immersed directly in the steel while still in the furnace. Earlier attempts on these lines failed because the heavy sheathing, believed to be essential for protecting the thermocouple, proved too expensive for routine work. The feature of the new method is the use of a very light and cheap silica sheath, which enables the thermocouple to be plunged into liquid steel so as to give a reading of temperature in a few seconds, and to be withdrawn intact. The method is applicable not only to furnaces of various types, but to molten steel at various stages after being tapped from the furnaces. It is now in use at a number of steel works.

Determination of the percentage of fat in milk was the subject of an exhibit in the Metrology Department. The determination is made by a rapid centrifugal method involving the use of accurately graduated glass butyrometers, having scales on which the percentage of fat can be read off directly. Large numbers of these butyrometers are tested annually at the laboratory to ensure the accuracy of the scales before the apparatus is used for testing milk.

An exhibit in the entrance hall was devoted to a general survey of the research work of the Department. Most of the investigations fall into one of two groups. One group is concerned with steels, especially those intended for use at high temperatures. The other group deals with alloys of the two light metals, aluminium and magnesium, which find increasing applications in daily life and are of the greatest importance in the construction of aircraft.

Changes During Heating or Cooling of Alloys

The automatic potentiometer and plotting chronograph, both devised in this Department, have been further improved and were shown in operation. Curves which indicate transformations during the heating or cooling of solid alloys are recorded in a completely automatic manner with greater smoothness than when visual observation and hand tapping are used.

An apparatus was shown, by means of which the action of superheated steam on steels under constant stress may be studied. The steel specimens are in the form of hollow "thimbles," stressed in tension by the internal pressure of steam, and maintained at a constant temperature by external heating in a regulated atmosphere. After the experiment, the scale formed on the steel is measured and examined microscopically.

A TEST FOR LANITAL

A test for Lanital, described by Rath and Burkhardt, is based on the fact that the fibre is hardened by the use of formaldehyde. It is said to be particularly useful in the case of textiles made from mixed fibres. A small piece of the material to be tested is boiled in water, acidified by the addition of a few drops of sulphuric acid. After a few minutes boiling, the liquid is added slowly drop by drop into a 1 per cent. solution of carbazole sulphate. When heated, if Lanital is present in the sample, the solution will show an intense blue colouration, followed by precipitation. The test is possible even when the quantity of formaldehyde is only 1 in ten thousand. In some cases the colour of dyed fibres may interfere.

PETROLEUM

A Source of Plastics and Synthetic Rubbers

By
HARRY BARRON, Ph.D., B.Sc., A.I.C., A.I.R.I.

FOR a number of years a great deal has been heard about the respective merits of petroleum and coal as sources of fuel. So important is this question of fuel that it has overshadowed most other considerations. Consequently there has been a tendency to overlook the fact that this rivalry is carried into other fields.

The production of chemical derivatives from coal appears to be almost inexhaustible and it has been one of the most spectacular scientific achievements of the age. Coal is a wonderful source of chemicals. Materials derived from coal tar form the basis from which innumerable types of commercially important products may be derived.

Until comparatively recently the possibilities of petroleum as a source of chemicals have been considered quite insignificant by comparison with coal. At the present time, however, new methods for the treatment of petroleum make it a serious competitor of coal in the chemical field. This is most clearly defined with regard to the newer chemical industries, particularly in relation to synthetic resins and plastics, and synthetic rubber-like materials.

For a number of years coal has enjoyed a paramount position as the source of raw materials from which many of the most important plastics are made. In fact it has been stated, very truly, that coal has been the foundation on which synthetic chemistry has been built.

This has definitely been the case in the production of phenol-formaldehyde resins, in which coal tar is of prime importance as a source of phenol, cresylic acid, and other derivatives, and also indirectly as a source of formaldehyde. In a similar manner coal has had a profound bearing on urea-formaldehyde resins, as a source of phthalic anhydride for glyptal resins, and so on.

Recent Developments

But in recent years coal has acquired an even greater significance in connection with the newer commercial plastics of the vinyl series. All these vinyl compounds are derived from acetylene of which the best known source is calcium carbide. In this instance coal is essential for use together with lime, to form calcium carbide from which acetylene is obtained, to be converted ultimately into vinyl compounds. This, too, is the initial step in the production of those materials from which the ever-growing number of synthetic rubbers are derived.

But coal no longer monopolises these fields of activity; petroleum is catching up. New methods have given it the opportunity to enter these same productions. The technique of high temperature "cracking" and of high temperature hydrogenation, are yielding amazing results. To give some examples of this. Both phenol and formaldehyde are being produced by suitable "cracking" of petroleum; obviously this enables the production of phenol-formaldehyde resins. Acetic anhydride and similar chemicals are being made, which can be utilised with cellulose to give cellulose acetate.

What is perhaps of much greater significance for future activities is the fact that petroleum is now the most important source of diolefines, such as ethylene, while acetylene is also obtained. From both of these, members of the vinyl group may be produced without difficulty, which on polymerisation yield commercially valuable plastics. Polymerised vinyl chloride and vinyl acetate are among those which have achieved great commercial importance already. Likewise from ethylene is obtained ethyl chloride, and other similar materials which also react with cellulose to give ethyl cellulose, and the group of cellulose ethers.

Where petroleum has an overwhelming advantage, is that materials such as propylenes and substituted acetylenes are obtained simply and directly. This gives a much greater scope, for not only can polymers or derivatives of acetylene and ethylene be obtained, but also the polymers of the homologues, without the necessity for complicated and expensive syntheses of the starting materials.

A new development illustrates the profound importance of these derivatives. Recently a great triumph has been achieved in the commercial synthesis of glycerine from petroleum. Hitherto glycerine has been obtained as a by-product of the soap industry, from animal fats, and also as a product of the fermentation of grain. The new process developed by the American chemists of the Shell Development Co. utilises propylene, an abundant waste product of petroleum cracking. The synthesis is carried out by means of reactions with chlorine, intermediate compounds including allyl chloride and allyl alcohol. This is a major chemical discovery. It may have the effect of stabilising the price of glycerine—a factor of major importance in numerous chemical industries. Since one of the major types of plastics is the glycerine-phthalic anhydride type, this is obviously of prime importance. It may in due course mean to this section of the plastics industry what synthetic phenol has meant to the phenol-formaldehyde plastics.

Synthetic Rubbers from Petroleum

It is evident that the synthetic rubbers can be produced from petroleum since the latter yields acetylene and ethylene, the materials from which all synthetic rubbers are derived.

Every commercial type of synthetic rubber has already been produced from petroleum derivatives. Neoprene is derived from chloroprene which in turn is obtained from acetylene by an ingenious series of reactions. The German "buna" synthetic rubbers are based on butadiene and its derivatives, which are also obtained either from acetylene, if obtained from coal, or from ethylene when working from petroleum. The "thiokol" type of synthetic rubbers, which are made by condensing a polysulphide with ethylene chloride, or some similar material, may likewise be produced from petroleum.

So far I have briefly indicated how successfully petroleum, and natural gas, are competing with coal as sources of raw materials for the manufacture of commercial synthetic resins and rubbers. Not only are petroleum derivatives coming into prominence in the production of existing plastics, but new materials are being developed.

New Types of Materials are being Obtained

Apart from this, new types of materials are being obtained which have no prototypes derived from coal or any other source. An outstanding example is the production of polymerised isobutylene plastics. When petroleum is cracked, unsaturated gaseous hydrocarbons are produced which contain considerable quantities of the hydrocarbon isobutylene. This may be separated and polymerised by passing over heated metallic halides, such as aluminium chloride, boron chloride, tin chloride, etc., to yield long open-chain polymers. These may have molecular weights ranging up to 300,000.

Poly-isobutylenes are extremely interesting plastics that have not yet received the attention that their properties merit. They are available as commercial materials in the United States under the name of "Vistanex," while the German materials are known as the "Oppanols." They range in consistency from viscous fluids up to extremely tough rubbery solids, depending on the molecular weight.

The most widely used type at the present time has a molecular weight of 100,000 and is of a similar consistency to raw rubber.

The solid types are extraordinary, inasmuch as they have astonishing elasticity and strength, but are nevertheless thermoplastic. The elasticity is illustrated by the fact that a typical commercial type will stretch to 1,000 per cent. and when released returns to within 5 per cent. of the original dimensions. This is far superior to raw rubber. They are extremely resistant to chemical attack, withstanding all the strong acids and alkalies, and many other corrosive materials. The only limitations in this respect are that they are attacked by halogens, i.e., chlorine, bromine, etc. They are quite impervious to water.

Polyisobutylenes are at a disadvantage insofar as they are soluble, or swell, in hydrocarbon solvents, chlorinated hydrocarbons, and so on. In this respect, of course, they are on a par with unvulcanised rubber, and are somewhat inferior to vulcanised rubber. On the other hand they are highly resistant towards oxidation and particularly to the action of ozone.

Electrical Characteristics

These properties together with extremely high electrical characteristics open up a wide field for electrical insulation purposes. Thus one commercial grade at 20° C., has a dielectric constant of 2.3, a power factor at 800 cycles of 0.0004, specific resistance greater than 10^{14} ohms per cubic centimetre, and a breakdown voltage of 23,000 volts per millimetre. This is a remarkably attractive group of properties.

So far as thermoplastic properties are concerned they may be illustrated by one commercial polyisobutylene with a molecular weight of 100,000. The mechanical properties are retained to over 100° C. and are unaffected by continued heating at this temperature. Above 100° C. it begins to soften and may be shaped or moulded at 200° C.; there is no decomposition until 350° C. and elasticity is maintained to minus 50° C. This is a remarkable temperature range for a material to exhibit elastic properties.

This type of synthetic rubber may be modified in many ways by addition of other materials. It is miscible with raw rubber, in fact small additions of rubber help to eliminate the tendency for cold flow which is inherent in all thermoplastics. On the other hand the addition of polyisobutylene improves the characteristics of rubber in many respects. They are also compatible with other synthetic rubbers. It is not surprising that they should be miscible since the polyisobutylenes are straightforward hydrocarbons. As a result, polyisobutylenes are compatible with natural resins, synthetic resins, waxes, bitumens, oils and so on. Additions of these to polyisobutylenes improve the working characteristics and many physical properties, while decreasing elasticity. At the other end of the scale, additions of polyisobutylene to these materials improve their own characteristics, giving pliability to waxes, elasticity to bitumens, and so on.

Fillers in Polyisobutylene

They may be compounded and pigmented in just the same way as rubber, the procedure being also similar. They can take up much higher loadings of filler than can raw rubber, e.g., with heavy fillers such as clay, talc, etc., up to 1,000 per cent. of material may be incorporated. It is interesting to note that additions of carbon black increase the tensile strength of the material, following the effect on rubber. Thus while polyisobutylene of molecular weight 100,000 shows a tensile strength at break of 900 lb. per square inch, with a loading of 50 per cent. carbon black, the tensile strength rises to 5,000 lb. per square inch, although elongation at break has decreased from 1,000 to 400 per cent.

From the point of view of handling, the material is generally treated in a similar manner to rubber. It may be milled and processed on standard plant. Invariably, however, much higher temperatures than are normally employed for rubber must be used, because below 150° C. the material is elastic and resembles vulcanised rubber, becoming markedly thermoplastic only above this temperature. Lower temperatures are employed when other materials are being incorporated, and particularly with fillers working temperatures may be reduced to well below 100° C.

Polyisobutylenes may be milled and compounded on rubber mixing machines; calendered and extruded on rubber plant. They are not capable of setting, so that the question of vulcanisation does not arise. Nevertheless in admixture with rubber, the whole mass may be vulcanised in the normal manner.

Polyisobutylenes of lower molecular weight, in a viscous fluid condition are being used as adhesives and for impregnation. The rubbery polyisobutylene can be taken up in solvents, to give viscous solutions which make satisfactory cements and impregnating and coating materials.

From this description of the properties of polymerised isobutylene, and particularly the high molecular weight materials, it is evident that they occupy a position between the thermoplastics of the vinyl family and synthetic rubbers of the butadiene type. They illustrate admirably the extremely wide range of modern materials that are now being derived from petroleum.

The importance of the growing use of petroleum derivatives in the production of plastics and synthetic rubbers, arises from the fact that the costs are lower than when they are derived from coal. In the United States it is maintained that synthetic rubbers of the "buna" type could be produced at half the present German cost of 2s. 6d. per pound. Indeed it is anticipated that it will shortly be possible to produce synthetic rubber that will cost only twice the price of latex rubber.

New Industries Proposed in India

Low Temperature Carbonisation and Fertiliser Manufacture

FROM A SPECIAL CORRESPONDENT.

THE Chemical Industries Committee, appointed by the Government of Bihar, has suggested in its report that the Government should make special efforts for the establishment of two special industries which have the greatest prospects in the province, namely, low temperature carbonisation and manufacture of fertilisers by nitrogen fixation. These two industries in the opinion of the Committee are of importance to all India, and the capital required for them will be of the order of Rs. 1,25,00,000.

As regards coal, it is recommended that the present wasteful method of soft coke manufacture should be prohibited by legislation and the manufacturers should be asked to instal low temperature carbonisation plants for the purpose. The Government of Bihar should supply technical advice if necessary, and tar obtained in the low temperature carbonisation process should be purchased by the Government at a fixed price and utilised for the manufacture of road tar and other products. The possibility of establishing a State factory for low temperature carbonisation in conjunction with the electrification scheme is also recommended to be explored.

As regards the manufacture of fertilisers, the establishment of a nitrogen fixation plant for the manufacture of cheap fertilisers is considered desirable, and it is recommended that a special committee of experts should be appointed to go into the question. Also the suitability of nitro-chalk for Bihar soil should be investigated by field experiments conducted by the Agricultural Department. Similarly, as a large quantity of bone is available in the province, it is recommended that the manufacture of superphosphates should be encouraged.

Among other industries, the manufacture of sulphuric acid linked up with the production of synthetic fertilisers is regarded as essential. The alkali industry is considered to be feasible as a provincial industry only.

THE CANADIAN CHEMICAL CONVENTION

General Review of Meeting held at London, Ontario

FROM A SPECIAL CORRESPONDENT.

MEASURED by attendance and the value of discussions relating to general matters of interest to industrial chemists, the twenty-second annual convention of Canadian chemical interests at London, Ontario, June 5 to 8, was noteworthy. The King and Queen visited the city during the period of the Convention, and while most of those present had other opportunities of seeing their Majesties, the headquarters of the Convention at the Hotel London presented a further chance of viewing a portion of the reception to excellent advantage.

To understand a Canadian meeting of this type, it is necessary to realise that the Canadian Chemical Association is a federation of a great many interests. The Canadian Institute of Chemistry, various sections of the Society of Chemical Industry, and a great many chemical and technical associations throughout the country pool their interests in a national meeting. Various officers of these societies play a prominent part during the programme—in particular, the President of the Canadian Chemical Association, Dr. R. K. Stratford, Chief Research Chemist, Imperial Oil, Ltd., who acted in a general way as President of the gathering. Next to him came Dr. Otto Maass, Professor of Chemistry at McGill University, in his capacity as President of the Canadian Institute of Chemistry. Unfortunately, Mr. Victor Bartram, President of the Society of Chemical Industry, could not be present owing to his immediate duties at Exeter, and Mr. T. W. Smith, Vice-President for Canada, took his place.

Arrangement of Technical Sessions

The meeting as a whole consisted of a series of technical sessions at which papers were received. These sessions are organised on a national basis and represent group interests. Sections meeting at this Convention included (1) Industrial and Engineering Chemistry; (2) Pure Chemistry; (3) Metallurgical and Mining Chemistry; (4) Food Product and Agricultural Chemistry; (5) Chemical Education.

During the period the annual meetings of various organisations were held and several committees of research councils and other interests met. The special general feature of the London meeting was the symposium on "Chemurgic Problems" or, broadly speaking, the application of products of agriculture as raw materials in industry. These matters, together with social functions—this year the Convocation of the University of Western Ontario, plus golf and exhibits of scientific apparatus, chemical raw materials and equipment—went to make up a programme possessing great diversification and interest for all classes of science workers and industrialists. No effort was made to restrict attendance to the membership of any organisation; visitors were extremely welcome and could take part in technical discussions and there was little formality.

The luncheon of the first day was a joint meeting with the Rotary Club of London, with Professor George Granger Brown, of the University of Michigan, speaking on "How Gasoline Burns." The National Chemurgic Committee of the Canadian Chamber of Commerce presented Hon. D. G. McKenzie, Vice-President, United Grain Growers, Ltd., Dr. Robert Newton, National Research Council, and Dr. Wm. J. Hale, of the Dow Chemical Co., as speakers.

Professor J. Watson Bain, first recipient of the Society of Chemical Industry (Canada) Medal.

Technical sessions reflected a very small portion of the research work being done in Canada, but sufficed for three days of the meeting. Most of the original work is sent directly to the literature or discussed before smaller groups and in any event, the papers given are too numerous to be reviewed in detail. Those that relate to original research are available elsewhere, but it may be stated that contributions from all Canadian universities are received before these sections and the Dominion Government Departments frequently review industrial work going forward in their laboratories. Such reports include reviews of recent data on the trade of chemical and process industries, exports, imports, and the development of raw materials. This year the work of the Standards Section of the National Research Council was discussed. The Dominion Government is setting up standards for immediate application in all Government business and has established a National Business Code. While these have not the effect of law in most instances, they create very convenient Canadian standards where none may have existed previously.

The Metallurgical Section

The metallurgical section offered as much new material as any other in the industrial field, presenting papers on the electrolysis of zinc sulphate solutions, the application of corrosion in heat resisting steel, a discussion of recently discovered hematite ore in North-Western Ontario, and the possibilities of producing magnesium in Canada.

Among the unusual papers contributed was one on the effect of small concentrations of fluorine in drinking water on teeth. A survey of the Province of Alberta has been made and it was found that the presence of fluorine in drinking waters of very low concentration, of the order of one to four parts per million, caused a type of mottling. Considerable work has been done on the treatment of such waters for drinking purposes. Alumina, dried and heated to low temperatures, and calcium phosphate were found to be effective.

The presidential addresses of the heads of organisations usually reflect the general position of science workers in some major way and the two delivered at London by Dr. R. K. Stratford and Professor Otto Maass were what might be described as "key note" speeches.

Summarising that of the President of the Canadian Chemical Association, it would appear that in the opinion of science workers Canada is doing far too little in matters relating to the conservation of resources. It has now been generally admitted that the method of opening up wheat growing lands in parts of Saskatchewan and Alberta, and a portion of Manitoba, was a great mistake. These prairie lands, while capable of growing the native grasses abundantly, have not been able to retain sufficient moisture to grow wheat continuously. Similarly, in some of the older districts the percentage of forest land has been so reduced as to affect the water levels quite seriously. Many older European countries have two or three times as much forest land as many districts in Ontario settled not more than a hundred years. A great many mistakes of the past and continuing mistakes of the present are commonly known and frequently science workers are called upon to attempt to

rectify them. The question is whether they have any responsibility or capacity to do more than their professional duties. Evidently Canadian science workers are eager to play their part and possess considerable zeal for the national welfare as citizens.

The question of further organisation, particularly in aid of agriculture, and indeed what might be described as a betterment in the economic conditions of agricultural workers, is an urgent problem and one that for some time past has failed to find a satisfactory answer.

Growth of the Canadian Institute of Chemistry

The President of the Institute of Chemistry reviewed the extremely rapid growth of the organisation in recent years. This body was established in 1920 with a Dominion Charter and has fostered the growth of professional chemical interests with success since that date. It is the only incorporated chemical organisation in the country. The growth in membership, while at first slow, has more recently become quite rapid with every indication that this body is likely to be a very powerful factor in the field of service.

Dr. R. J. Moore, President of the American Institute of Chemists, Director of Research, The Bakelite Corporation, was a guest speaker. He reviewed and interpreted the position of the professional chemist in the United States at the present time. Chemists still lack legal definition and as a result, according to Dr. Moore, are exposed to the pressure of labour organisers. Companies in some instances insist that their chemists be members of a satisfactory labour organisation before they can be appointed, and in some instances applications for positions are asked for labour union cards before their applications can be considered. Unless state legislation is established to give professional status to chemists, there is apparently some risk that they will be compelled to accept organisation on a labour union basis. Thus it may happen that a chemist may be employed in a laboratory but unable to go into the plant because he is not a union operator; therefore, he must not have anything to do with equipment. On the medical and biochemical sides as well, differences of opinion have arisen to indicate that the position of the chemist should be better defined by law. At the present time the movement seems to be towards a licensing arrangement that will not be compulsory but that will make it necessary for consulting chemists to register, and others may register if they wish to do so, thereby joining a professional group which becomes exempt from labour regulations. The need for some kind of legislation specifically relating to the position of chemists is apparently becoming more urgent in the United States, although the position in Canada has remained comparatively unchanged.

Presentation of the S.C.I. (Canada) Medal

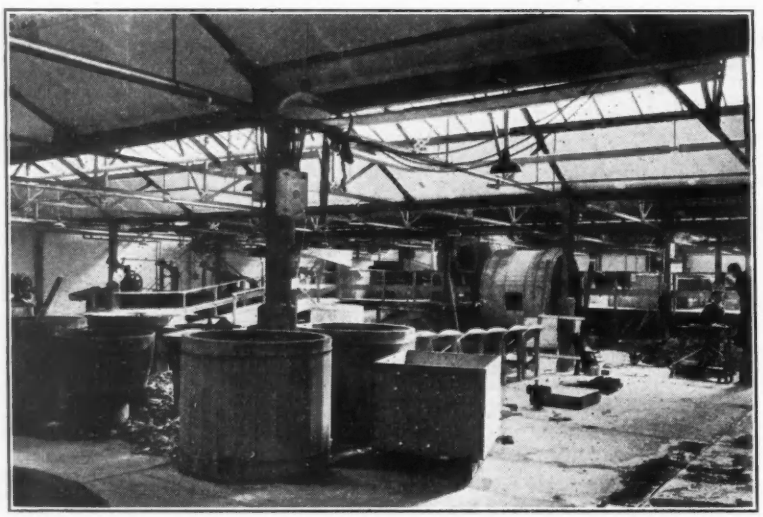
One of the happiest features of the whole meeting was the presentation to Professor James Watson Bain, head of the Department of Chemical Engineering at the University of Toronto, and one of the founders of the Society of Chemical Industry in Canada, with the new Society of Chemical Industry (Canada) medal. This is the first medal of any kind that any Canadian chemical organisation has established, and Mr. Victor Bartram, this year's President of the Society, should be given credit for the idea. Before a full attendance of the whole convention, Professor Bain received this honour and delivered an address on the subject of Chemical Engineering Education as applied to Canada's needs.

Treforest Trading Estate

Premier Impressed by Success of the Enterprise

THE Prime Minister, the Right Hon. Neville Chamberlain, paid his first visit to the Treforest Trading Estate, South Wales, last Saturday, and was evidently very much impressed by what he saw, for a considerable part of the speech which he made at Cardiff later that day was devoted to it. Accompanied by Mr. R. Pierce Jones, Divisional Controller for Wales of the Ministry of Labour, the Prime Minister was received by Colonel Gerald T. Bruce, chairman of the Trading Estates Company, and his fellow directors, who were able to give him a good account of progress. He was told that very nearly a hundred factories were let and that forty-five were already in production.

During his tour of the Estate, the Prime Minister made a visit to the factory of Treforest Chrome Leather Works, Ltd., second tenants on the Estate to reach production and now having a substantial and rapidly increasing output.



Wet-shop in the factory of the Treforest Chrome Leather Works, Ltd., on the Estate, visited by the Prime Minister on Saturday.

In his Cardiff speech the Premier said :—

"I consider the Treforest Trading Estate to be one of the most heartening things which I have seen in South Wales. There are quite a large number of factories there, all employed upon new industries to South Wales. Some of them were brought by people who had to leave their own country. They have shown that South Wales is a place where such industries can be carried on at a profit, and that South Wales men and girls can adapt themselves to new conditions of factory life and can quickly master the technique necessary to turn out the articles which are being produced.

"I took particular care to ask those people whether they found it satisfactory, because I had heard it suggested that labour in Wales was sometimes intractable. They gave me the best account of the people whom they had trained—they have found them willing, hard-working, quick, and clever with their hands. Those who come down and see what is being done at Treforest will regard it as a most valuable object-lesson, and that it will not only be the means of giving employment to a considerable number of people on the estate, but will act as an encouragement to other manufacturers to come and try their hand in South Wales, where, at any rate, they need not be afraid of air raids, and where other people have been able to carry on their trades with profit and advantage to themselves."

Slander Alleged against Gas Manager

Low Temperature Carbonisation Plant Dispute

EVIDENCE in the action for £10,000 damages for alleged slander against John Wauchope M'Lusky, gas manager of Glasgow Corporation, was led in Glasgow Sheriff Court on June 21 before Sheriff Guild. Robert Maclaurin, technical chemist, Stirling, inventor of the Maclaurin low temperature carbonisation plant, was pursuer. He averred that statements in reports made by M'Lusky had been altered to represent, or were intended to represent, that, after receiving a fair trial, the Maclaurin process had proved a complete failure as a commercial proposition.

M'Lusky denied these allegations, and averred that the statements made by him of the various reports and documents referred to were true in substance and fact, and were honestly and properly made by him in the discharge of his duties to the Glasgow Corporation as general manager of the Gas Department. The plant referred to had been operated at Dalmarnock Gas Works.

Working Report

It was brought out that about 1922 Maclaurin submitted proposals to the Corporation showing the working costs and probable revenue to be obtained from the process. Mr. M'Lusky prepared a report at the direction of the Cost Committee on tests which were carried out at Mr. Maclaurin's plant at Grangemouth, and ultimately the Corporation agreed to erect a battery of five-unit Maclaurin Producers at Dalmarnock. These were worked for about seven years, and results were contained in the annual reports of the Corporation Gas Dept. Defender avers that the statements made by him in the various reports and documents were true in substance and fact, and honestly and properly made by him in the discharge of his duties with Glasgow Corporation as general manager of the Gas Dept.

An accountant for pursuer, Mr. Gilbert S. M'Vean, criticised various reports which are lodged in process, and also the accounts of the Gas Department from the period 1926-32. He alleged that the accounts did not truly reflect the work of the plant. That was to the detriment of the Maclaurin process.

Hearing was adjourned.

Letter to the Editor

Article on Solvents and Plasticisers—

A Mis-statement

SIR,—In your issue of the 24th instant, in the article on solvents and plasticisers by Mr. Brittain, on page 471 there is a serious mis-statement to which we wish to draw the attention of readers as well as of the author.

Talking about ethyl lactate, Mr. Brittain says "it is one of the few esters soluble in water, and this rather detracts from its value as a solvent as it tends to encourage 'blushing.'" As many users of ethyl lactate will bear us out, this solvent, although completely soluble in water, has the remarkable property that its solutions of nitrocellulose and of cellulose acetate can absorb large quantities of water (up to 50 per cent.), without causing either precipitation or "blushing" of the cellulose ester while the lacquer is drying.

Confirmation of these remarks will be found in "Solvents" by Durrans, 4th edition, page 146.—Yours faithfully,

H. LLOYD HOWARD,
Director.

Howards and Sons, Ltd.,
Uphall Works,
Ilford.

June 28.

Nickel as Dehydrogenating Catalyst

Further Work on its Action with Alcohols

FURTHER work in this field, in addition to that of Raymond Paul, already reported (*Chemical Age*, June 17, page 453) has been undertaken by Palfray and Sabatier, in continuance of their earlier investigations to which reference was made by Paul. They had then pointed out that Sabatier and Senderens, in their classic researches with nickel as a hydrogenation catalyst had, even at that comparatively early date, observed its reverse action in the direction of dehydrogenation, and had in fact obtained the corresponding carbonyl compounds from alcohols. But the action went too far and they concluded, provisionally at least, that nickel was too active for dehydrogenation; that reduced copper was better for this purpose, and silver still better, for in the latter case temperatures could be reduced to the neighbourhood of 200° C. Reference was also made to the numerous experiments of Ipatieff with high pressures and temperatures, as described in his book on the subject ("Catalytic Reactions at High Temperatures and under High Pressures," New York, 1936), and to the general literature review of the whole subject given by O. B. J. Fraser, on "Nickel as a Catalyst," (*Trans. Electrochem. Soc.* 1937, *71*, 19).

Interest in the subject was stimulated by Raymond Paul who has drawn attention to some rather remarkable properties of Raney nickel, doubtless due to its peculiar structure (*Bull. Soc. Chim.* 5th ser., 1938, *5*, 1592). He found that nickel in this form was a very efficient dehydrogenating catalyst for primary alcohols at comparatively low temperatures; but from the experiments carried out by Bougault, Cattelain and Chabrier (*loc. cit.*, 1699) indicating that Raney nickel is undoubtedly a hydride, it would seem that this catalyst has varied activities under different conditions, and these workers have even used it for de-oxidation. Palfray and Sabatier first proceeded to show that, so far as secondary alcohols are concerned at all events, any form of nickel catalyst whether freshly prepared or aged or of the Raney type, could be used for dehydrogenation, and the presence of a hydride or of water was unnecessary (*Comptes Rendus*, 1939, *208*, 109). The alcohols used included phenylmethylcarbinol, menthol, and cyclohoexanediol-1.4, at temperatures between 170° and 250°. In the liquid phase nickel in any form was effective, especially with the secondary alcohols, and copper was much less so. But with the primary alcohols under similar conditions they found dehydrogenation much more difficult.

They have now extended their researches in order to determine optimum conditions with various alcohols (*Comptes Rendus*, 1939, *208*, 1654). With tetrahydro-ionol the optimum temp. was 250° and the nickel percentage 5. Ketone yield was 20 per cent. in five minutes, increasing to 56 per cent. in fifteen minutes, and much more slowly.to 78 per cent. in four hours. With tetrahydro-methylionol the temp. was again 250°, as also with beta-decalol. Wtih the cyclohexanediols and cholesterol the optimum temp. was 240° and time two hours.

DETECTION OF POLYPHENOLS

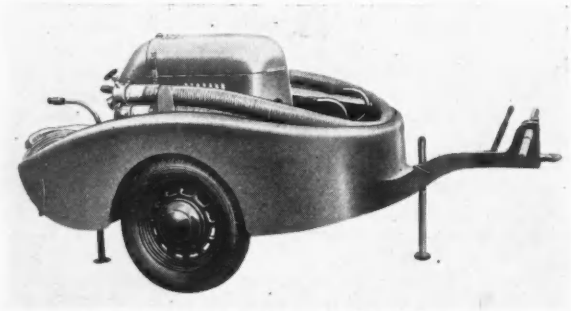
A new colour reaction for the qualitative detection of polyphenols is described by Ashkenasi (*Jour. Appl. Chem. U.S.S.R.*, 1939, *12*, 312). The procedure is to dissolve the phenol in absolute alcohol, containing sodium ethylate in solution, and to shake the solution in such a way as to cause aerial oxidation. Monophenols remain colourless under this treatment, but di- and triatomic phenols develop more or less rapidly very different colours, the speed of the reaction depending on the juxtaposition of the OH groups. Thus with diatomic compounds, those with the OH groups in the ortho position react quickly, whereas with them in the meta or para position the speed of reaction is much less. Alkylation of one or both of the hydroxyl hydrogen atoms in diatomic, and of two of all three in triatomic phenols, inhibits the reaction.

Recent Trade Literature

B.E.N. PATENTS, LTD., have issued a folder entitled "Protection for essential industries," illustrating and describing their special portable displacement sprayer for camouflage and window dimming. The B.E.N. sprayer with its 30-gallon pressure paint container and two spray guns, has a rapid and efficient coverage (approx. 1,000 sq. yards in 30 minutes using a light bituminous camouflage paint), and is compact and readily portable.

DOULTON AND CO., LTD., have recently issued their latest list of laboratory porcelain. As befits an organisation which has been producing laboratory porcelain at its Lambeth works for nearly a quarter of a century the list is a most comprehensive one and includes combustion boats, crucibles, mercury troughs, Buchnor funnels, porous ceramic filters, evaporating basins, etc. The specifications of each item are given together with an excellent illustration.

The latest bulletin of WORTHINGTON-SIMPSON, LTD., describes and illustrates their mobile fire pumps. There are no bearings in the pump and no attention is required other than occasionally lubricating the outside ball thrust bearing



A Worthington-Simpson mobile fire pump.

The single inlet shrouded type gunmetal impeller is mounted on a splined high tensile steel shaft having a renewable bronze sleeve. The pump is powered by a Ford engine which is water-cooled by thermosyphon from a two-gallon water tank supplemented by a by-pass from the pump through a dual filter mounted on the dash. The entire pump and engine is enclosed in a pressed steel housing. A trailer, specially designed and manufactured, provides the mobility.

A folder describing the multipoint temperature indicator manufactured by NEGRETTI AND ZAMBRA has been recently issued by the company. Among the points illustrated are the appearance of the instrument which is contained in a diecast case finished in black, the selector switch which is hermetically sealed and in which dust and fume proof mercury-in-glass switches ensure constant contact resistance and freedom from inaccurate readings, a sensitivity of 20 ohms per millivolt, obtained by means of high magnet power as opposed to fragile moving coil system, and an automatic cold junction control fitted as standard when used with thermocouples.

According to a recent Home Office publication eye accidents are among the most serious of non-fatal industrial accidents, investigation having shown that about 10 per cent. of the blind in this country have developed blindness as a result of industrial eye injuries. Accordingly, it is interesting to note two leaflets recently issued by SAFETY PRODUCTS, LTD. One describes Pulsafe eyeshields for workers in chemical, gas and cement works, foundries, etc. Made of a practically non-inflammable cellulose material these shields range from a type which fits almost flush with the face, although it is so fitted that adequate ventilation is ensured, to one with an industrial veil which is claimed to be of particular value in gas and chemical works. The other leaflet deals with Pulsafe goggles for chippers, grinders, riveters, etc., of which there are two types. The first is a spectacle type of goggle and the second is designed to be worn under the most hazardous conditions and includes sideshields.

New Technical Books

PHYSICAL CONSTANTS OF HYDROCARBONS. Vol. 1. By Gustav Egloff. Pp. 403. London: Chapman and Hall, Ltd. New York: Reinhold Publishing Corporation. 45s.

Under the impetus of a constantly increasing demand for hydrocarbon products, the amount of research performed in this field of science has been particularly great during the past fifteen years and customary sources of physical constant data have become inadequate due to more precise developments in the synthesis, purification, and methods of determining physical constants. In the present work the critical study of the hydrocarbon constants and their inter-relationships to derive useful and sound generalisations has been the desired goal. The work is presented in four volumes and covers the melting point, boiling point, specific gravity, and refractive index of all classes of pure hydrocarbons as well as their inter-relationships. Volume I deals with the paraffins, olefines, acetylenes, and other aliphatic hydrocarbons, the physical constants of which have been critically reviewed and the most reliable values derived therefrom.

MAGNESIUM, MAGNESITE AND DOLOMITE. By J. Lumsden. Pp. 126. London: Imperial Institute. 2s. 6d.

The latest of the mineral monographs issued by the Imperial Institute deals with magnesium, magnesite and dolomite. The work not only covers all aspects of the magnesium metal industry and the other industries in which magnesite and dolomite play an important part, but also reviews the world resources of magnesium minerals of economic importance, particularly magnesite. Although special emphasis is laid on Empire deposits those in foreign countries are by no means neglected, 29 countries in all being dealt with. In addition to descriptions of the deposits, chemical analyses and tables of production and trade statistics are included where possible. The monograph concludes with a selected list of references to technical literature.

Magnesium metal now occupies a position of great importance in the light metals industry. The commercial manufacture of the metal was for long a matter of great technical difficulty and Germany was the only manufacturer. Processes developed during the past few years, however, have led to a greatly increased output, present world production being, it is estimated, in the region of 25,000 tons, most of which is employed in the light metals industry. Apart from its use in alloys, the most important modern use of magnesium is as a scavenger in metal refining on account of its strong chemical affinity for oxygen and nitrogen.

The book includes a brief historical review of the magnesium industry in the most important producing countries, and, although official statistical information regarding production is not always available, estimates are given for probable production in 1938.

Although magnesite is the chief raw material for the manufacture of magnesium metal, it is much more important as a refractory material, especially in steel furnaces, in which it is used mainly in the form of magnesite bricks. It is widely distributed in nature, though extensive deposits of economic importance are limited to some eight or nine countries. The various types found, each with its own peculiar properties, are described, together with their mode of occurrence and methods of working. Strict temperature control in the calcining process is important in order that the products, caustic calcined magnesite and dead-burned magnesite, may be obtained in their optimum condition. The former is employed in the manufacture of magnesium oxychloride cements for composition floors and the latter in refractories and as the starting point in the manufacture of magnesium metal.

The monograph also includes sections on dolomite and naturally occurring magnesium salts, the uses for which these are particularly adapted being described.

"Magnesium, Magnesite, and Dolomite" should prove of considerable value to those specially interested in light metals or refractories, and the general reader will find in it much of interest regarding the development of magnesium as a raw material of industry.

PERSONAL NOTES

DR. H. J. EMELEUS has been awarded the title of Reader in Inorganic Chemistry of London University in respect of the post held by him at the Imperial College.

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DR. A. E. BRADFIELD, at present lecturer in the Chemistry Department at the Bangor College of the University of Wales, has accepted an appointment as research officer to the Indian Tea Association.

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DR. W. S. PATTERSON, head of the Chemistry Department of Sunderland Technical College, has been awarded the D.Sc. degree of the University of London for a thesis covering a series of investigations on metallic corrosion.

* * * *

DR. GEORGE SENTER, the principal of Birkbeck College, London University, is retiring at the close of the present session. Born in 1874, he qualified as a chemist and druggist in 1896 and graduated as Bachelor of Science (London

Dr. G. Senter.

University), with first class honours in Chemistry, in 1900. Subsequently he gained the degrees of D.Sc. (London) and Ph.D. (Leipzig). He held the appointment of lecturer in chemistry at St. Mary's Hospital Medical School from 1904 to 1913 and was head of the chemistry department of Birkbeck College from 1914 to 1932. He was deputy Vice-chancellor of London University in 1933-34 and was a member of the Senate for a number of years. Dr. Senter is a Fellow of the Institute of the Chemistry (being elected in 1915) and the author of several text-books.

* * * *

PROFESSOR I. M. HEILBRON, D.S.O., D.Sc., F.R.S., Professor of Organic Chemistry in the University of London; and SIR A. R. DUNCAN, G.B.E., LL.B., chairman of the Executive Committee of the Iron and Steel Federation of Great Britain, have received the honorary of LL.D. at Glasgow University.

* * * *

MR. R. STURGEON, who has for some time been a member of the chemical staff of University College, Nottingham, has just been appointed assistant to the Director of Research of the United Glass Bottle Manufacturing Co., Charlton. Mr. Sturgeon is an expert on glass, and before going to Nottingham was senior analytical assistant in the Department of Glass Technology at Sheffield University.

SIR WILLIAM FIRTH, chairman of Richard Thomas & Co., Ltd., the steel and tinplate manufacturers, has been re-elected president of the Incorporated Metal Exchange.

* * * *

MR. T. F. HARLE, a lecturer at Southampton University and a specialist on the specific heats of metals, has been appointed to the Research Department, R.A.F. establishment, Farnborough.

* * * *

MR. LAMMOT DU PONT, of E.I. du Pont de Nemours & Co., has been elected president of the Manufacturing Chemists' Association of the U.S.A. He succeeds Mr. E. M. Allen, of the Mathieson Alkali Works, who has joined the Executive Committee.

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MR. RALPH S. LUMSDEN, an honours graduate in chemistry of St. Andrews University, has been awarded a Caird Travelling Scholarship of £450. He is going to the Massachusetts Institute of Technology, where he will study chemical engineering.

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MR. GEORGE FERGUSON, assistant manager of the rolling mills of Frederick Braby and Co., Ltd., Glasgow, has been appointed to the post of manager. He has been in the service of the company for more than 40 years and is a well-known figure in the iron and steel industry in Great Britain.

* * * *

DR. W. H. COATES, a director of Imperial Chemical Industries, Ltd., has been appointed a member of a committee, established at a meeting called by the Association of British Chambers of Commerce, to draw up a report for presentation to the Chancellor of the Exchequer on the proposals for an Armament Profits Duty. Mr. Coates is one of the representatives of the Federation of British Industries on the Committee.

* * * *

MR. WILLIAM P. COHOE has been elected chairman of the American Section of the Society of Chemical Industry for the year 1939-40. The elections of the other officers are:—Vice-chairman, LINCOLN T. WORK; honorary secretary, CYRIL S. KIMBALL; and honorary treasurer, J. W. H. RANDALL. The following new Committee members were elected to take the place of retiring members:—L. W. BASS, J. V. N. DORR, C. R. DOWNS, J. C. HOSTETTER, and E. P. STEVENSON.

* * * *

DR. CHARLES GALTON DARWIN, director of the National Physical Laboratory, Teddington; EMERITUS PROFESSOR ALEXANDER MCKENZIE, Professor of Chemistry in University College, Dundee, from 1914 to 1938; and SIR ALBERT C. SEWARD, president of the British Association, are among those who will receive the honorary degree of LL.D. of St. Andrews University at a graduation ceremony which will be held in Dundee during the visit of the British Association to that city.

MR. REGINALD W. PRESTON, a director of the Distillers Co. and other companies, has left estate valued at £24,922 (net personalty £24,347).

* * * *

SIR HENRI DETERDING, who was for many years general manager of the Royal Dutch Shell group of companies, has left estate valued at £370,400.

OBITUARY

MR. J. C. SMITH, president of the Shawinigan Falls Water and Power Co., and of Subsidiary Companies, including Shawinigan Chemical Industries, died in Montreal on Saturday last at the age of 60.

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Soap and some modern detergents. Warwicke, *Text Colorist, 61,* 315-317.

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Effect of soaps in increasing the water-solubility of essential oils. Albert, *J. Soc. Chem. Ind., 58,* 196-199.

Glycerine and glycerine substitutes. Hübscher, *Seifensieder Ztg., 66,* 345-346.

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Paints, Pigments

Solvents for quick-drying inks. Bogin, *Amer. Ink Maker, 17,* No. 5, 19-25.

Cellulose ester finishes: solvents, resins and plasticisers. Metzinger, *Paint Oil Chem. Rev., 101,* No. 11, 7-10.

Zinc oxide in paint. Nelson, *Drugs Oils Paints, 54,* 162-164.

Fish oils in paint technology. Pawelzik, *Fette u. Seifen, 46,* 195-200.

Rubber, Resins, Plastics

Urea-formaldehyde film-forming compositions. Hodgins and Hovey, *Ind. Eng. Chem., 31,* 673-678.

Comparative plasticity measurements on rubber and rubber mixes. Hagen, *Kautschuk, 15,* 88-95.

Polyalcohols in the manufacture of glycerophthalate resins. Monnet-Sabin, *Rev. Générale Matières Plastiques, 15,* 132-134.

Decolorising of colophony. Blin, *Matières Grasses Pétrole et Dérivés, 31,* 103-104.

Seed-lac. Murty, Gardner and Gross, *Ind. Eng. Chem., 31,* 678-680.

Miscellaneous

Air-conditioning. Downs and Spiselman, *Ind. Eng. Chem., 31,* 681-698.

General News——From Week to Week

THE SOUTH AFRICAN PAVILION from the Empire Exhibition, Glasgow, is being erected at the I.C.I. factory at Ardeer, where it will be used as a canteen hall.

AN ARTICLE BY DAVIS IN *Ths Practitioner* (May issue) discussing contact dermatitis, mentions 1 per cent. aluminium acetate solution as an effective local treatment.

CHINA CLAY SHIPMENTS are showing improvement despite the political disturbance on the Continent. The volume dealt with in May exceeded 65,245 tons, an increase of nearly 19,000 tons compared with May, 1938.

DAMAGES OF £550 AND COSTS were awarded at Liverpool Assizes last week against Manbré and Garton, Ltd. It was stated that while working near a cooker machine on November 17, 1936, a belt came off and the metal fastening on the belt struck and injured the plaintiff.

SPEAKING AT THE SOUTHAMPTON TRANSPORT CONGRESS, Mr. R. P. Biddle, Docks and Marine Manager, described the importance to the area of oil imports and oil processing. The Port is a leading centre for this traffic and oil fuel imported and stored in the Docks area reached 1,108,000 tons last year.

A SCOTTISH CORRESPONDENT reports that substantial progress has been made by certain private interests in the preparation of a scheme for the production of calcium carbide in Inverness-shire. Ample financial backing is assured. Contact will shortly be established with the Departments to ascertain the measure of Government aid that would be forthcoming for a detailed scheme.

THE ANNUAL CONFERENCE of the Sanitary Inspectors' Association, will take place at Bournemouth from September 4 to 9. The conference this year will welcome Mr. J. C. Dawes of the Ministry of Health, who succeeds Sir Leonard Hill in the presidency of the Association. Among the subjects for discussion at the Conference is "Modern Methods in Preventing Food Spoilage," on which Dr. W. Clayton will deliver a lecture.

WITH A VIEW TO SPEEDING UP the production of gas masks, the Clyde Rubber Works Co., Ltd., Renfrew, have acquired the Lomeshay Mills, Nelson, Lancashire, which until recently have been operated by the Union Rubber Company. The Renfrew firm have an order for a million and a half gas masks, and to maintain the schedule of 140,000 per week, an augmentation of production facilities was considered necessary.

HULL IS NOW REAPING THE BENEFIT of ten years of continuous effort in proclaiming its advantages as an industrial centre and the annual Report, just published by the Development Committee, records the establishment of a variety of industries. While the amount of direct employment provided is considerable and is a welcome relief to the unemployment situation, the effect of the establishment of the new industries upon the existing trade of the City and Port is remarkable. In imported raw materials alone it is estimated that the new industries are bringing an additional half million pounds worth of new trade to the Port annually. Hull has secured these new industries without the offer of subsidies or special concessions and the decisions to commence in Hull have been arrived at on purely economic grounds.

AN EXHIBITION, illustrating methods of decontaminating in war-time leather affected by poison gases, was held at the Leathersellers' Hall, E.C.3, on Wednesday and Thursday. Leather, because of its peculiar characteristics, presented a number of difficulties in this important part of air-raid precautions, and the results of two years' research by the British Leather Manufacturers' Research Association in collaboration with the Chemical Defence Research Department of the War Office were shown. Many poison gases are quickly dissipated by wind and draught, but a few, particularly mustard gas, dissipate slowly. Research was therefore being concentrated upon mustard gases. It has been found that the only practical method of decontamination on a large scale is by immersion in water, but not in boiling water which destroys all leathers. Most types of leather may be decontaminated from the effects of mustard gases by being steeped for six hours in water at a temperature of between 120 and 130 deg. F. One of the few types of leather which will not stand up to this process is any leather which has been alum-tanned. Many leather articles which have been passed through the process successfully, together with the decontamination plant, were shown at the Exhibition.

FIRE BROKE OUT on Wednesday night in the boiler house at the I.C.I. works at Billingham. The flames were prevented from spreading to the power station nearby and also to the hydrogen plant. The outbreak was got under control within two hours.

A NEW PAPER-COATING FACTORY at the mills of the Clyde Paper Co., Ltd., Rutherglen, was formally opened last week. Before the new factory was erected for coating work, representatives of the firm visited America and the Continent to study the latest developments in this branch of the industry, and the principles evolved have never before been embodied in paper-coating plant in this country.

FIVE MORE PROSPECTING LICENCES have been issued by the Board of Trade to the Anglo-American Oil Co., Ltd. The licences concern three contiguous areas covering about 442 square miles in Lancashire, including the towns of Chorley, St. Helens, and Preston; an area of about 45 square miles in Lancashire, and adjacent sea bed, including Formby Point; and an area of about 86 square miles in Midlothian and Peebles, including the village of Temple.

Foreign News

THE FIRST JUGOSLAVIAN PHOTOGRAPHIC PAPER FACTORY at Tezna near Marburg recently started production. It is claimed that the factory will be capable of coping with almost the entire demand of the country.

A MOBILE CRACKING PLANT now under construction in the Soviet Union by the Glawgas Trust will be used for the conversion of heavy naphtha products into a gas containing up to 35 per cent. acetylene.

THE ALUMINIUM COMPANY OF CANADA announced in Montreal last week, a substantial expansion of its manufacturing facilities, entailing expenditures of about $7,000,000, including a new plant at Kingston, Ontario. In connection with this plant it is reported that the British Government is planning an expenditure of about $13,500,000, mainly for finished aluminium for aeroplanes.

ABOUT 600 PERSONS, including a number of eminent scientists, are expected to attend the first All-Union Conference on Vitamins which is being held in Moscow this month under the auspices of the Academy of Sciences of the U.S.S.R., the Soviet vitamin industry and the Commissariat of Health of the U.S.S.R. Questions relating to the chemistry and bio-chemistry of vitamins and vitaminised foods, the origin of vitamins, their application in medicine and prophylactics will be discussed at the conference.

A NEW ROUTE TO SYNTHETIC RUBBER is suggested by the discovery that esters of butane diol-2,3 are readily converted into butadiene (L. Denivelle, *Comptes Rendus*, 1939, 1024). The diacetate, obtained almost quantitatively by prolonged heating of the diol with excess of acetic anhydride, decomposes into butadiene when contacted with kaolin at a high temperature, the optimum temperature being 575° C. In the same way the neutral sulphite of butane diol, prepared by treatment with thionyl chloride in presence of pyridine, is partly converted into butadiene when passed over kaolin, the pyrogenation mixture at 575° C. containing 8 to 10 per cent. of the diene.

A REVISED EDITION of Technical Paper 8, "Methods of Analysing Coal and Coke," has recently been published by the Bureau of Mines, U.S. Department of the Interior. Revised by A. C. Fieldner and W. A. Selvig, the edition includes much material not found in the former editions, including details of methods of analysis of coal and coke ashes, determination of iron forms in coal ash slags and clinkers, determination of sulphur forms and carbon dioxide in coal, and agglutinating or caking characteristics of coals as determined by examination of the residue in the crucible incident to the standard test for volatile matter. Revisions have been made in many of the methods given in the former editions including proximate and ultimate analysis, methods for phosphorus, calorific value, specific gravity, fusibility of coal ash, and shatter test for coke.

EXPERIMENTAL PRODUCTION OF MOTORCAR TYRES containing a high content of synthetic rubber has been commenced at a Moscow factory using the Sovprene rubber for which the starting material is acetylene.

THE MISR BANK in conjunction with an Egyptian finance group is sponsoring the erection of a pharmaceutical factory in Egypt by a firm which will bear the name of Soc. Misr pour la Fabrication des Médicaments et des Produits Pharmaceutiques.

CONSTRUCTION OF A GAS PIPELINE from the natural gas fields to Bucharest is under consideration by the Soc. Nationale de Gaz Metan (Sonametan) which intends to double its existing share capital of 320 million lei.

A NEW SYNTHETIC NITRIC ACID PLANT is under construction at Feuchy by the Soc. de Produits Chimiques et Engrais d'Auby and will be completed early in 1940. With a daily output capacity of 85 to 105 tons nitric acid, the plant will be essentially similar to the one erected in 1936 and operating continuously since that date.

THE CHRISTOU GRAIN TRADING AND INDUSTRIAL CO. has been registered in Athens with a capital of 4½ million drachmas and will engage in the production and marketing of essential oils and chemical products. Another newly formed concern, the E.V.R.O.P.A. Co. (capital 3 million drachmas), will deal with a variety of materials such as resins, alcohol and potassium carbonate.

AT THE INSTANCE of the Government of Bihar an investigation of the carbonisation of various low grade coals with a view to finding out their suitability for the production of soft coke and for the utilisation of the by-products has been started at the Science College, Patna. The investigation is a step in the direction of placing the coal and coke industry of the province on a scientific basis by testing different grades of coal with regard to their yields of coke, tar, gases and ammonia. A pilot plant for the low temperature distillation of coal, according to a method worked out by Dr. H. K. Sen, Director of the Indian Lac Research Institute, Ranchi, was operated satisfactorily at the Science College, Patna, on May 26, for the first time. The Government of Bihar are considering the question of a further grant to enable detailed work being conducted on this important problem of national fuel economy.

PLANS ARE BEING CONSIDERED for the utilisation of Jugoslavian natural gas in such directions as train illuminants, motorcar fuels and carbon black manufacture. The principal fields are in Bujavica and Golo (Kutina).

A NEW CHEMICAL CONCERN in which the State holds an interest has been formed in Roumania under the style of Industria Mecanica si Chimica and plans the erection of several manufacturing plants at Girdoveni in the Prahova region.

A NEW EMBEDDING MATERIAL for botanical and animal preparations introduced by the I. G. Farbenindustrie is in the form of a permanently clear urea-formaldehyde condensation product which can be solidified with a special hardening agent after the specimen has been immersed.

ALTHOUGH THE VALUE OF EXPORTS from Egypt of Sudanese gum arabic fell from £E.717,798 to £E.662,658, between the years 1937-38; the volume increased from 19,761 tons in 1937 to 23,980 in 1938. During these two years, the purchases of Sudanese gum arabic by Great Britain (which leads the market) increased from 5,279 to 5,772 tons.

THE ANNUAL REPORT of the Norwegian Council for Industrial Research surveys the work in progress on such problems as the production of fertilisers by treatment of crude phosphates with lime; utilisation of powdered peat in admixture with 10 per cent. coal as a fuel for central heating installations; and the canning of fruits and vegetables without loss of vitamin content.

AMONG THE PROBLEMS now engaging the attention of the Warsaw Chemical Research Institute are the production of active carbon; bleaching earths and gels from inland raw materials; improvement of the process for synthetic rubber manufacture from alcohol; electrolytic production of sodium, lithium and magnesium, manufacture of sulphuric acid and cement from gypsum.

A NEW PHARMACOPOEIA of the U.S.S.R. is being compiled by the standing pharmacopoeial committee appointed by the Commissariat of Health of the U.S.S.R. The last pharmacopoeia of the U.S.S.R. published in 1924 is now out of date; many drugs which in those days used to be imported are now produced from home raw materials, and many new medicaments have appeared on the market. The new pharmacopoeia will be issued in 1941 and will contain a thousand items.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

MANUFACTURE OF HORN-LIKE PLASTIC MATERIALS.—Agricultural and Chemical Products, Ltd., and J. Guttmann. 17414.

PRODUCTION OF MONOHYDRIC ALCOHOLS, etc., from gases containing olefines.—Agricultural and Chemical Products, Ltd., and J. Guttmann. 17415.

PRODUCTION OF NAPHTHALENE.—Appleby-Frodingham Steel Co., Ltd., and H. P. Stephenson. 17295.

MANUFACTURE OF VARNISHES, ETC.—H. V. A. Briscoe. 17024.

COLOURATION OF TEXTILE MATERIALS.—British Celanese, Ltd. (United States, June 14, '38.) 17389.

PLASTIC MOULDING COMPOSITIONS.—British Thomson-Houston Co., Ltd. (United States, June 8, '38.) 16815.

VARNISHES.—British Thomson-Houston Co., Ltd. (Germany, June 15, '38.) 17299.

FLUORESCENT MATERIALS.—British Thomson-Houston Co., Ltd. (United States, June 17, '38.) 17409.

AZO DYESTUFFS, ETC.—E. I. du Pont de Nemours and Co. (United States, June 11, '38.) 17196, 17206.

PRODUCTION OF TITANIUM PIGMENTS.—E. I. du Pont de Nemours and Co. (United States, June 15, '38.) 17323.

PRODUCTION OF RESINOUS COMPOSITIONS.—E. I. du Pont de Nemours and Co. and R. A. Jacobson. 17001.

AGENTS FOR COMBATING PESTS.—J. R. Geigy A.-G. (Switzerland, June 11, '38.) 16933.

ACYLATED P-AMINOBENZYL AMINES, ETC.—J. R. Geigy A.-G. (Switzerland, June 10, '38.) 17005. (Switzerland, March 16.) 17006.

REGENERATION OF BASE EXCHANGE MATERIALS.—E. B. Higgins. 17304.

MANUFACTURE OF BUTADIENE.—G. W. Johnson (I. G. Farbenindustrie). 17026.

MANUFACTURE, ETC., OF STABLE LEUCO DERIVATIVES of anthraquinone vat dyestuffs.—G. W. Johnson (I. G. Farbenindustrie). 17406, 17407.

PREPARATION OF THERAPEUTICALLY USEFUL HETEROCYCLIC COMPOUNDS.—May and Baker, Ltd., A. J. Ewins and M. A. Phillips. 16836.

PROCESS FOR REFINING HYDROCARBONS, ETC.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (United States, June 21, '38.) 16991.

PREPARATION OF LUMINESCENT SUBSTANCES.—J. D. Riedel-E. de Haen A.-G. (Germany, Feb. 2.) 16835.

PREPARATION OF O. O'DIHYDROXYDIPHENYL.—Rutgerswerke A.-G. (Germany, June 22, '38.) 17180.

PRODUCTION, ETC., OF SOLUTIONS of high molecular weight sulphur-containing condensation products.—Rutgerswerke A.-G. (Germany, July 14, '38.) 17421.

SEPARATION OF SOLVENTS, etc., from gaseous mixtures.—Soc. des Etablissements Barbet. (France, June 11, '38.) 16990.

MANUFACTURE OF CATALYSTS.—Standard Oil Development Co. (United States, Aug. 31, '38.) 17061.

DIESEL FUELS.—Standard Oil Development Co. (United States, July 21, '38.) 17293.

Complete Specifications Open to Public Inspection

MANUFACTURE OF LUBRICATING OILS from olefines.—Standard Oil Development Co. Dec. 7, 1937. 9423/38.

MEANS FOR PLASTICISING VEGETABLE FIBROUS MATERIALS, and process for the production of constructional elements, and constructional elements made by such process.—G. Buckwitz. Dec. 8, 1937. 25225/38.

PREPARATION OF STABLE AQUEOUS SOLUTIONS containing *k*-strophanthin theophylline and dextrose of concentrations suitable for injection purposes.—Chemisch-Pharmazeutische Akt.-Ges. Bad Homburg. Dec. 7, 1937. 28503/38.

MANUFACTURE OF CATION-EXCHANGE ARTIFICIAL RESINS.—I. G. Farbenindustrie. Dec. 11, 1937. 32837/38.

METHOD OF CONVERTING LIQUID HYDROCARBONS into highly-compressible dry gas.—R. Arnold. Dec. 7, 1937. 33416/38.

WATER-PAINTS.—Home and Industrial Building Products, Ltd. Dec. 6, 1937. 35412/38.

MANUFACTURE OF QUINHYDRONES.—Soc. of Chemical Industry in Basle. Dec. 6, 1937. (Cognate Applications, 35514/38 and 35515/38.) 35513/38.

PRINTING TEXTILE PRODUCTS.—Soc. of Chemical Industry in Basle. Dec. 7, 1937. (Cognate Applications, 35517/38 and 35518/38.) 35516/38.

PREPARATION OF LEAD SULPHATE PRODUCTS, particularly adapted for use as pigments.—National Lead Co. Dec. 6, 1937. 35535/38.

PRODUCTION OF GLUTAMIC ACID and its salts.—Corn Products Refining Co. Dec. 6, 1937. 35560/38.

CATALYTIC POLYMERISATION OF OLEFINES.—I. G. Farbenindustrie. Dec. 6, 1937. 35583/38.

PRODUCTION OF PHOTOGRAPHIC EMULSIONS.—O. Czeija, and F. Lierg. Dec. 6, 1937. (Cognate Application, 35594/38.) 35593/38.

MANUFACTURE OF ALIPHATIC KETONE-DIARYLAMINE ANTI-OXIDANTS. United States Rubber Products, Inc. Dec. 9, 1937. 35784/38; 35785/38; 35786/38.

MANUFACTURE OF ACID-WOOL DYESTUFFS.—I. G. Farbenindustrie. Dec. 8, 1937. 35878/38.

MANUFACTURE OF ZIRCONIUM METAL.—I. G. Farbenindustrie. Dec. 9, 1937. 35879/38.

PRODUCTION OF COLOURED ARTIFICIAL MATERIALS.—British Celanese, Ltd. Dec. 10, 1937. 36055/38.

PRODUCTION OF CELLULOSE DERIVATIVES.—British Celanese, Ltd. Dec. 10, 1937. 36056/38.

PRODUCTION OF STARCH PRODUCTS.—Corn Products Refining Co. Dec. 10, 1937. 36082-3/38.

PROCESS FOR THE MANUFACTURE OF PIGMENTS and dyestuffs.—I. G. Farbenindustrie. Dec. 10, 1937. 36108/38.

Specifications Accepted with Date of Application

PROCESS FOR THE MANUFACTURE OF CELLULOSE DERIVATIVES and for treating fibrous materials therewith.—L. Lilienfeld. Sept. 7, 1937. 507,137.

COMPOSITION FOR ACCELERATING THE GROWTH OF PLANTS and a method of making the same.—Dow Chemical Co. Oct. 7, 1936. 506,910.

PREPARATION OF IMPERMEABLE CORROSION-RESISTING COATINGS.—C. F. Lumb. Oct. 5, 1937. 507,057.

MANUFACTURE AND APPLICATION OF AZO DYESTUFFS.—Kodak, Ltd. Oct. 7, 1937. 506,995.

MANUFACTURE AND USE OF CHEMICAL SUBSTANCES.—W. H. Moss. Dec. 4, 1937. 506,999.

MANUFACTURE AND PRODUCTION OF RUBBER-LIKE POLYMERISATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) Dec. 6, 1937. 506,926.

MANUFACTURE OF CELLULOSE ETHERS.—D. C. Mandeville, A. A. Houghton, and Imperial Chemical Industries, Ltd. Dec. 6, 1937. 507,203.

HYDROGENATION OF NAPHTHYLAMINES.—Imperial Chemical Industries, Ltd. Dec. 5, 1936. 506,928.

MANUFACTURE OF COMPOUNDS of the anthraquinone series.—H. C. Olpin. Dec. 7, 1937. 507,065.

MANUFACTURE AND PRODUCTION OF HIGH MOLECULAR WEIGHT ALDEHYDES, ketones, and alcohols.—G. W. Johnson (I. G. Farbenindustrie.) Dec. 7, 1937. (Samples furnished.) 507,204.

PRODUCTION OF SYNTHETIC RESINS.—Bakelite, Ltd. Dec. 9, 1936. 507,013.

MANUFACTURE OF COMPOUNDS of the anthraquinone series.—H. C. Olpin and C. F. Topham. Dec. 8, 1937. 507,206.

COMPOSITION FOR USE IN CONDITIONING WATER for boilers and like apparatus and for removing scale from such apparatus, and/or preventing its formation therein.—R. H. Turnbull. Dec. 8, 1937. 507,072.

MANUFACTURE OF HYDROHALIDES of substituted iso-thioureas.—W. W. Groves (I. G. Farbenindustrie.) Dec. 8, 1937. 507,207.

MANUFACTURE OF MASSES capable of hardening rapidly in the cold from phenol-formaldehyde condensation products.—W. W. Groves (I. G. Farbenindustrie.) Dec. 8, 1937. 507,208.

MANUFACTURE AND PRODUCTION OF ETHYLENE from saturated hydrocarbons.—G. W. Johnson (I. G. Farbenindustrie.) Dec. 8, 1937. 506,832.

MANUFACTURE OF ORTHO-OXYAZO DYESTUFFS.—I. G. Farbenindustrie. Jan. 13, 1937. 507,169.

INSECTICIDAL COMPOSITIONS.—B. Collie, W. H. Davies, W. A. Sexton, and Imperial Chemical Industries, Ltd. Dec. 10, 1937. 507,221.

MANUFACTURE OF SYMMETRICAL DI-HYDROXYALKYLATED AMINO-ARSENOBENZENES.—I. G. Farbenindustrie. Dec. 19, 1936. 507,186.

PROCESS FOR THE MANUFACTURE OF VOLUMINOUS PRODUCTS from dolomite or other raw materials containing the carbonates of calcium and magnesium.—G. De Becze. Jan. 28, 1938. 507,091.

PYROLYTIC REFORMING OF HYDROCARBON OIL DISTILLATES.—Universal Oil Products Co. June 30, 1937. 506,849.

MANUFACTURE AND PRODUCTION OF HIGH MOLECULAR WEIGHT ALDEHYDES, ketones, and alcohols.—I. G. Farbenindustrie. Feb. 6, 1937. 506,850.

PROCESS FOR THE MANUFACTURE OF ALCOHOLS of the cyclopentanopolyhydrophenanthrene series.—Schering, A.-G. March 1, 1937. 506,859.

METHOD FOR THE REMOVAL OF CARBONIC OXIDE from combustible gases or mixtures of combustible gases containing organic sulphur compounds by a contact process with steam catalysis.—R. Brandt. May 27, 1938. (Addition to 490,920.) 507,120.

MANUFACTURE OF HYDROGEN PEROXIDE.—A. C. Semidei. June 9, 1937. 507,121.

MANUFACTURE OF ORGANIC ESTERS OF CELLULOSE.—British Celanese, Ltd. Aug. 14, 1937. 507,126.

METHOD FOR EFFECTING THE ALKALINE DECOMPOSITION OF BAUXITE. Vereinigte Aluminium-Werke, A.-G. Oct. 13, 1937. 506,885.

WOOD PULP adapted for chemical use.—Hercules Powder Co. Dec. 9, 1937. (Addition to 463,437.) 507,040.

EXTRACTING SUGAR FROM MOLASSES BY DIALYSIS.—Sylvania Industrial Corporation. Oct. 28, 1937. 506,889.

MANUFACTURE OF RUBBER POWDERS and rubber-dispersions.—Centrale Vereeniging Tot Beheer Van Proefstations Voor de Overjarige Cultures in Nederlandschindie Jan. 12, 1938. 506,902.

TOILET SOAPS.—E. Pick. July 4, 1938. 506,903.

TREATING ANIMAL AND VEGETABLE OILS and fats for retarding oxidation and the development of rancidity.—Kodak, Ltd. (Eastman Kodak Co.). Sept. 10, 1937. 507,471.

MANUFACTURE OF PAINTS containing aqueous binders.—E. Alberti (trading as Vereinigte Werke Dr. R. Alberti and Co.). July 24, 1937. 507,472.

DISTILLATION OR CONSOLIDATION OF COAL or other materials by the application of heat.—T. M. Davidson. Oct. 7, 1937. 507,236.

MANUFACTURE OF STEEL.—Kohle-und Eisenforschung Ges. Nov. 19, 1936. 507,321.

CHROMIUM METALLURGY and the manufacture of chromium steel. M. J. Udy. Sept. 24, 1937. 507,558.

PREPARATION OF DIAMIDINE DERIVATIVES.—May and Baker, Ltd., A. J. Ewins, H. J. Barber, G. Newbery, J. N. Ashley, and A. D. H. Self. Dec. 10, 1937. 507,565.

MANUFACTURE AND PRODUCTION OF GASEOUS OLEFINES.—G. W. Johnson (I. G. Farbenindustrie.) Dec. 13, 1937. 507,567.

PRODUCTION OF ORGANIC COMPOUNDS of relatively low molecular-weight containing sulphur and oxygen.—A. H. Stevens. Dec. 14, 1937. 507,339.

MANUFACTURE OF CYCLIC ACETALS OF FORMALDEHYDE.—W. W. Groves (I. G. Farbenindustrie.) Dec. 14, 1937. 507,571.

MANUFACTURE OF DIMERS OF OLEFINES.—Standard Oil Development Co. Jan. 26, 1937. 507,439.

REDUCTION OF METAL OXIDES.—H. Gallusser. Dec. 16, 1936. 507,494.

MANUFACTURE OF GUANIDINE NITRATE.—R. Burns, P. F. Gay, and Imperial Chemical Industries, Ltd. Dec. 15, 1937. 507,498.

REDUCTION OF OXIDES of metals or non-metals.—H. Gallusser. Dec. 16, 1937. 507,581.

MANUFACTURE OF LUBRICATING-OILS.—C. Arnold (Standard Oil Development Co.). Dec. 16, 1937. 507,636.

LIQUID ADHESIVE COMPOSITIONS prepared from plastic polymerised chloroprene.—B. B. Chemical Co., Ltd. Dec. 28, 1936. 507,637.

MANUFACTURE OF ACID ANHYDRIDES.—H. F. Oxley and E. B. Thomas. Dec. 17, 1937. 507,592.

TREATMENT OF GASES containing sulphur.—W. H. Groombridge, and R. Page. Dec. 17, 1937. 507,593.

MANUFACTURE AND PRODUCTION OF WAX-LIKE SUBSTANCES.—G. W. Johnson (I. G. Farbenindustrie.) Dec. 21, 1937. 507,244.

MANUFACTURE OF TITANIUM PIGMENTS.—Titan Co., Inc. Dec. 24, 1936. (Addition to 499,153.) 507,506.

MANUFACTURE OF MOTOR FUELS.—Standard Oil Development Co. Feb. 6, 1937. (Addition to 445,503 and 504,837.) 507,246.

MANUFACTURE OF SULPHATE OF AMMONIA.—T. B. Smith, and Dorman, Long and Co., Ltd. Feb. 8, 1938. 507,351.

PROCESSES FOR THE MANUFACTURE OF CARBON BLACK from carbon-containing gases.—D. Gardner. Feb. 18, 1938. 507,516.

PRODUCING SYNTHETIC PEPPERMINT OIL.—E. H. Harberd (Dr. Hittel Ges.). March 7, 1938. (Convention date not granted.) 507,257.

PRODUCING DIAZOBIGUANIDES.—Calco Chemical Co., Inc. April 2, 1937. 507,260.

SYNTHESISING HYDROCARBONS from carbon monoxide and hydrogen.—Metallges, A.-G., and W. Herbert. April 25, 1938. 507,366.

PRODUCTION OF FATTY ACIDS by oxidation of paraffin hydrocarbons.—W. A. Farenholtz, G. Hubbe, and H. Hubbe (trading as Vereinigte Oelfabriken Hubbe and Farenholtz), and K. Blass. May 4, 1938. 507,521.

MANUFACTURE OF HALOGENATED AMINO-SULPHONES.—A. Carpmael (I. G. Farbenindustrie.) Dec. 21, 1937. (Divided out of 490,047.) 507,378.

SULPHURISED OILS.—Standard Oil Development Co. Oct. 8, 1937. 507,385.

MANUFACTURE OF WATER-INSOLUBLE AZO-DYESTUFFS.—I. G. Farbenindustrie. Aug. 30, 1937. 507,274.

CONVERSION OF HYDROCARBON OILS.—Universal Oil Products Co. Sept. 13, 1937. 507,389.

PRODUCTION OF DYESTUFFS on the fibre.—I. G. Farbenindustrie. Oct. 1, 1937. 507,528.

MANUFACTURE AND PRODUCTION OF OLEFINE OXIDES.—I. G. Farbenindustrie. Nov. 18, 1937. 507,538.

PRODUCTION OF MAGNESIUM ALLOYS.—F. Christen. Sept. 16, 1938. 507,294.

PROCESS FOR THE MANUFACTURE OF 1.4 5.8-TETRAMINO-ANTHRAQUINONE.—Soc. Rhodiaceta. Dec. 24, 1937. 507,302.

PROCESS FOR THE MANUFACTURE OF IRON OXIDE.—W. Glaser. Feb. 9, 1939. 507,316.

REAGENT TO FLOCCULATE COAL SLURRY WATER in coal washeries. W. Wilson. March 2, 1939. 507,553.

Weekly Prices of British Chemical Products

CONDITIONS in the general chemical market this week have not been particularly active most sections reporting only a quiet demand. Deliveries under existing contracts cover fair quantities but so far as new business is concerned the market requirements appear to be satisfied. The price position remains unaltered quotations continuing at recent levels. A steady seasonal demand is being put through for tartaric and citric acids but, taken on the whole, the market is without feature. Interest has been somewhat subdued in the market for coal tar products this week with both buyers and sellers marking time. There are no price features to record and quotations generally are on a nominal basis.

MANCHESTER.—Generally steady price conditions have been reported during the past week on the Manchester chemical market, especially among the heavy chemicals, the demand for contract deliveries of which is maintained on a fairly satisfactory scale, with an improving tendency reported in the call for textile chemicals for both Lancashire and Yorkshire users. So far as new bookings are concerned, however, business has continued on moderate lines, with a sprinkling of additional contracts for delivery over the second half of the year. With regard to the by-products, most of the heavy materials are quiet and further easiness has developed in crude tar, but the light distillates are mostly steady and in fair demand

Price Changes

Falls: Arsenic, continental material; Benzol, crude (Manchester); Pitch (Manchester).

GLASGOW.—There has been a steady day-to-day demand for general chemicals for home trade industrial use during the week, and rather more inquiry for export. Prices generally continue very firm at about previous figures, with no important changes to report.

General Chemicals

ACETONE.—£39 to £43 per ton, according to quantity.

ACETIC ACID.—Tech., 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech., glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE (see Salammoniac).—Firsts, lump, spot, £42 17s. 6d. per ton; d/d address in barrels. Dog-tooth crystals, £35 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

AMMONIUM DICHROMATE.—8¼d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £10 10s. per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £15 10s. per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contract. GLASGOW: £9 5s. per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16 per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CALCIUM CHLORIDE.—GLASGOW: 70/75% solid, £5 12s. 6d. per ton ex store.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4½d. per lb. d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2⅝d. per lb.; liquor, £13 per ton d/d station in drums.

CHROMIC ACID.—9d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0¼d. per lb. MANCHESTER: 1s. 0¼d. GLASGOW: B.P. crystals, 1s. 0¼d. per lb; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in casks. MANCHESTER: £18 12s. 6d. per ton f.o.b. GLASGOW: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, £4 12s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1,260 s.g., in tins, £3 10s. to £4 10s. per cwt. according to quantity; in drums, £3 2s. 6d. to £3 16s. 0d. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. MANCHESTER: White, £31; brown, £30. GLASGOW: White crystals, £29 10s.; brown, £1 per ton less.

LEAD NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£30 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. GLASGOW: £30 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—GLASGOW: Ground, £30 per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. GLASGOW: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY PRODUCTS.—Ammoniated B.P. (white precip.), lump, 6s. 5d. per lb.; powder B.P., 6s. 7d.; bichloride B.P. (corros. sub.), 5s. 8d.; powder B.P., 5s. 4d.; chloride B.P. (calomel), 6s. 5d.; red oxide cryst. (red precip.), 7s. 6d.; levig, 6s. 9d.; yellow oxide B.P. 6s. 10d.; persulphate white B.P.C., 6s. 7d.; sulphide black (hyd. sulph cum. sulph. 50%), 6s. 6d. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. MANCHESTER: £49 to £55 per ton ex store. GLASGOW: £2 9s. per cwt. in casks.

PARAFFIN WAX.—GLASGOW: 3¾d. per lb.

POTASH, CAUSTIC.—Solid, £33 5s. to £38 per ton according to quantity, ex store; broken, £40 per ton. MANCHESTER: £38.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. MANCHESTER: £37 per ton. GLASGOW: 4¼d. per lb.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. GLASGOW: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity.

POTASSIUM PERMANGANATE.—LONDON: 9¼d. to 10¼d. per lb. MANCHESTER: B.P. 9½d. to 11¼d. GLASGOW: B.P. Crystals, 10½d.

POTASSIUM PRUSSIATE.—5¼d. to 6d. per lb. MANCHESTER: Yellow, 6d. to 6¼d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6¾d. per lb. net, ex store.

SALT CAKE.—Unground, spot, £3 8s. 6d. per ton.

SODA ASH.—Light 98/100%, £5 17s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £13 10s. per ton d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£19-£20 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags in 1-ton lots. MANCHESTER: £10 15s. GLASGOW: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags.

SODIUM BISULPHITE POWDER.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

SODIUM CARBONATE MONOHYDRATE.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.
SODIUM CHLORATE.—£27 10s. to £32 per ton. GLASGOW: £1 11s. per cwt., minimum 3 cwt. lots.
SODIUM DICHROMATE.—Crystals cake and powder 4¼d. per lb. net d/d U.K. with rebates for contracts. GLASGOW: 4¼d. per lb., carriage paid.
SODIUM CHROMATE.—4¼d. per lb. d/d U.K.
SODIUM HYPOSULPHITE.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. MANCHESTER: Commercial, £11; photographic, £15 10s.
SODIUM METASILICATE.—£14 5s. per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £8 per ton for 6-ton lots d/d. GLASGOW: £1 12s. per cwt. in 1-cwt. kegs, net, ex store.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, £4 per cwt. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.
SODIUM PRUSSIATE.—4d. per lb. for ton lots. MANCHESTER: 4¼d. to 5d. GLASGOW: 4d.
SODIUM SILICATE.—£8 2s. 6d. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. MANCHESTER: £3 10s.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 10s.
SODIUM SULPHITE.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
SULPHURIC ACID.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.
TARTARIC ACID.— 1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1¼d. per lb. GLASGOW: 1s. 1¼d. per lb., 5%, ex store.
ZINC SULPHATE.—Tech., £11 10s. f.o.r., in 2-cwt. bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £6 10s. per ton, according to quality.
CADMIUM SULPHIDE.—3s. 0d. to 3s. 3d. per lb.
CARBON BLACK.—3⅜d. to 4 1/16d. per lb., ex store.
CARBON DISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 11½d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4¼d. to 5d. per lb.; dark 3⅜d. to 4⅜d. per lb.
LAMP BLACK.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. per lb., 1-cwt. lots.
ZINC SULPHIDE.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

AMMONIUM SULPHATE.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.
CALCIUM CYANAMIDE.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d;. March, £7 17s. 6d.; April/June, £7 18s. 9d.
NITRO CHALK.—£7 10s. 6d. per ton up to June 30, 1939.
SODIUM NITRATE.—£8 per ton for delivery up to June 30, 1939.
CONCENTRATED COMPLETE FERTILISERS.—£11 4s. to £11 13s. per ton in 6-ton lots to farmer's nearest station.
AMMONIUM PHOSPHATE FERTILISERS.—£10 19s. 6d. to £14 16s. 6d. per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9d. MANCHESTER: Crude, 1s 0½d. per gal.; pure, 1s. 8d. to 1s. 8½d. per gal.
CARBOLIC ACID.—Crystals, 6½d. to 7½d. per lb., small quantities would be dearer; Crude, 60's 1s. 7d. to 1s. 10d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.
CREOSOTE.—Home trade, 3¾d. to 4d. per gal., f.o.r., makers' works; exports 6d. to 6¼d. per gal., according to grade. MANCHESTER: 3¼d. to 4½d.
CRESYLIC ACID.—97/99%, 1s. 5d. to 1s. 8d.; 99/100%, 2s. to 2s. 6d. per gal., according to specification. MANCHESTER: Pale, 99/100%, 1s. 6d.
NAPHTHA.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1½d. to 1s. 3d. per gal., naked at works, according to quantity. MANCHESTER: 90/160%, 1s. 5d. to 1s. 7½d. per gal.
NAPHTHALENE.—Crude, whizzed or hot pressed, £4 10s. to £5 10s. per ton; purified crystals, £9 10s. per ton in 2-cwt. bags. LONDON: Fire lighter quality, £3 to £4 10s. per ton. MANCHESTER: Refined, £10 10s. to £12 per ton f.o.b.
PITCH.—Medium, soft, 26s. per ton, f.o.b. MANCHESTER: 24s. f.o.b., East Coast.
PYRIDINE.—90/140%, 12s. 6d. to 14s. per gal.; 90/160%, 10s. 6d. to 11s. 6d. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. MANCHESTER: 10s. 6d. to 14s. per gallon.
TOLUOL.—90%, 2s. 1d. to 2s. 2d. per gal.; pure 2s. 5d. to 2s. 6d. MANCHESTER: Pure, 2s. 5d. per gallon, naked.
XYLOL.—Commercial, 2s. 3d. per gal.; pure, 2s. 5d. MANCHESTER: 2s. 4d. per gallon.

Wood Distillation Products

CALCIUM ACETATE.—Brown, £6 15s. to £9 5s. per ton; grey, £8 to £8 5s. MANCHESTER: Brown, £8; grey, £9 10s.
METHYL ACETONE.—40.50%, £32 to £35 per ton.
WOOD CREOSOTE.—Unrefined, 6d. to 8d. per gal., according to boiling range.
WOOD NAPHTHA, MISCIBLE.— 2s. 8d. to 3s. per gal;. solvent, 3s. to 3s. 5d. per gal.
WOOD TAR.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZIDINE, HCl.—2s. 7½d. per lb., 100% as base, in casks.
BENZOIC ACID, 1914 B.P. (ex toluol).— 1s. 11½d. per lb. d/d buyer's works.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL 34/35° C.— 1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—2s. 1½d. to 2s. 5½d. per lb.
DIMETHYLANILINE.—Spot, 1s. 7½d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£79 5s. per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 11d.
DIPHENYLAMINE.—Spot, 2s. 2d. per lb.; d/d buyer's works.
GAMMA ACID, Spot, 4s. 4½d. per lb. 100%, d/d buyer's works.
H ACID.—Spot, 2s. 7d. per lb.; 100%, d/d buyer's works.
NAPHTHIONIC ACID.—1s. 10d. per lb.
β-NAPHTHOL.—£97 per ton; flake, £94 8s. per ton.
α-NAPHTHYLAMINE.—Lumps, 1s. 1d. per lb.
β-NAPHTHYLAMINE.—Spot, 3s. per lb.; d/d buyer's works.
NEVILLE AND WINTHER'S ACID.—Spot, 3s. 3½d. per lb. 100%.
o-NITRANILINE.—4s. 3½d. per lb.
m-NITRANILINE.—Spot, 2s. 10d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 10d. to 1s. 11d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra, 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9½d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.
SULPHANILIC ACID.—Spot, 8¾d. per lb. 100%, d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10 cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, June 28.—LINSEED OIL was steady. Spot, £27 per ton (small quantities); July and Aug., £24 10s.; Sept.-Dec., £24 7s. 6d; Jan.-April, £24 7s. 6d. SOYA BEAN OIL was quiet. Oriental, July-Aug. shipment, c.i.f., bulk, £18 per ton. RAPE OIL was dull. Crude extracted, £31 10s. per ton; technical refined, £32 15s., naked, ex wharf. COTTON OIL was slow. Egyptian, crude, £18 per ton; refined common edible, £21 15s.; deodorised, £23 15s., naked, ex mill (small lots £1 10s extra). TURPENTINE was easier. American, spot, 33s. 3d. per cwt.; July-Aug., 32s. 9d.
HULL.—LINSEED OIL.—Spot, £25 2s. 6d. per ton; June, £24 12s. 6d.; July-Aug., £24 10s.; Sept.-Dec., £24 7s. 6d. COTTON OIL.—Egyptian, crude, spot, £17 10s. per ton; edible, refined, spot, £20 10s.; technical, spot, £20 10s.; deodorised, £22 10s., naked. PALM KERNEL OIL.—Crude, f.m.q., spot, £17 10s. per ton, naked. GROUNDNUT OIL.—Extracted, spot, £23 per ton; deodorised, £26. RAPE OIL.—Extracted, spot, £30 10s. per ton; refined, £31 10s. SOYA OIL.—Extracted, spot, £25 10s. per ton; deodorised, £28 10s. COD OIL.—F.o.r. or f.a.s., 25s. per cwt., in barrels. CASTOR OIL.—Pharmaceutical, 39s. 6d. per cwt.; first, 34s. 6d.; second, 32s. 6d. TURPENTINE.—American, spot, 35s. 3d. per cwt.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

THOMAS PETTIFER AND CO., LTD., Northampton, medicine manufacturers. (M., 1/7/39.) June 14, charge, by way of confirmation and ratification of mortgage registered Sept. 30, 1938, by resolution of shareholders, to Lloyds Bank Ltd.; charged on offices, buildings, three cottages, and land at Eydon. *£800 May 26, 1939.

Declaration of Solvency Filed

LONDON ALUMINIUM CO., LTD. (D.S.F., 1/7/39.) Birmingham. June 20.

Receiverships

ACME CHEMICAL CO., LTD., Tonbridge. (R., 1/7/39.) C. J. Maples has ceased to act as receiver and manager. June 14.

Company News

L.T.C. Distillates, Ltd., a subsidiary of Low Temperature Carbonisation, Ltd., has changed its name to British Diesel Oil and Petrol Co., Ltd.

British Industrial Plastics, Ltd.—Interim report states that for six months ending March profits of group were in excess of those for corresponding period a year ago.

Triplex Safety Glass Co., Ltd.—At an extraordinary general meeting on Wednesday it was unanimously agreed to acquire not less than 90 per cent. of the issued share capital of Lancegaye Safety Glass (1934), Ltd.

British Glues and Chemicals, Ltd., report for year to April 30 profits of £78,810 (£87,912). After providing £5,000 towards A.R.P. contingencies, dividends are unchanged at 10 per cent. on ordinary and 9 per cent. on participating preference. General reserve receives £10,000 (same), provision for taxation, £4,000 (£6,000); forward, £31,806 (£31,746).

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

British India.—A firm of agents established at Bombay wishes to obtain the representation, on a commission and consignment basis, of United Kingdom manufacturers of heavy chemicals for Western India. (Ref. No. 517.)

British India.—A well-established firm of agents at Karachi wishes to obtain the representation, on a commission and consignment basis, of United Kingdom manufacturers of patent medicines, perfumery, toilet requisites for Sind, Punjab, Baluchistan, North West Frontier and United Provinces, Delhi and Rajputana. (Ref. No. 518.)

India, Burma and Ceylon.—A well-established firm of agents at Bombay wishes to obtain the representation, on a commission and consignment basis, of United Kingdom manufacturers of industrial chemicals for the textile, soap, and glass industries, textile dyes, china clay for India, Burma and Ceylon. (Ref. No. 521.)

Sweden.—A firm of agents established at Stockholm wishes to obtain the representation of United Kingdom manufacturers of tartaric acid, citric acid, soya beans, copra, vegetable oils. (Ref. No. 531.)

Brazil.—A firm of agents established at Rio de Janeiro wishes to obtain the representation of United Kingdom manufacturers of explosives (trotyl, dynamite, No. 8 electric detonators, No. 8 and No. 6 common detonators, common black and white fuses), chemicals (chlorate of potassium, toluol, orthonitro-toluol, synthetic camphor) for Brazil. (Ref. No. 535.)

New Companies Registered

D. F. Cartwright, Ltd. 354,072.—Private company. Capital £1,000 in 1,000 shares of £1 each. To carry on at Cradley Heath, Staffs., and/or elsewhere the business of pharmaceutical, consulting, analytical, manufacturing, wholesale and retail chemists, etc. Directors: Donald F. Cartright, 17 Beecher Street, Colley Gate, Cradley, Staffs.; and Fdk. Cartwright.

South Wales Chemical Works, Ltd.—353,868. Private company. Capital, £1,000 in 1,000 shares of £1 each. To carry on the business of manufacturers, exporters, importers and shippers of and wholesale and retail dealers in chemical products of all kinds, etc. Subscribers (each with one share): Romy Fink, 317 High Holborn, W.C.1; Leonard W. Chapman.

Beugger, Watson Chemicals, Ltd. 353,336.—Private company. Capital £100 in 100 shares of £1 each. To carry on the business of manufacturers and merchants of and dealers in all classes of fine chemicals and pharmaceutical products, etc. Directors: Mrs. Vida H. Watson Beugger, The Red House, Loom Lane, Radlett, Herts; Knud J.A. Beugger. Registered office: Wardrobe Chambers, 146a Queen Victoria Street, E.C.4.

Chemical and Allied Stocks and Shares

PENDING some reduction of tension in international politics the industrial and other sections of the Stock Exchange have continued to show a reactionary tendency, and share values are again lower on balance. Nevertheless markets had a somewhat steadier undertone than last week, although the volume of business passing was extremely small.

* * * *

Distillers were a relatively steady feature, and at 94s. are little changed, aided by market hopes that the impending results may show the maintenance of the distribution at 22½ per cent. United Molasses were also firmer, and at 24s. 4½d. are within a few pence of the price ruling a week ago. B. Laporte were less active, but were again 58s. 9d. and Fison Packard, which continued to show a fair amount of activity, were steady at 40s. 9d., which, however, is 6d. below the price ruling a week ago. British Match were firm and unchanged at 33s. 6d. and Reckitt and Sons' ordinary were little changed at 102s.

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On the other hand Turner and Newall went back from 78s. to 77s. 3d. and Murex from 76s. 3d. to 75s., while Lever and Unilever were lower at 36s. 3d., compared with 37s. Imperial Chemical lost 9d. to 30s., while the preference units were 29s. 10½d., compared with 30s. 7½d. Swedish Match reacted from 25s. 6d. to 24s. 9d. Associated Cement were lower at 66s. 3d., but British Plaster Board rallied to 28s. 6d. on the hint given at the meeting of impending bonus proposals. Pinchin Johnson declined 6d. to 23s. 6d., but International Paint at 81s. 3d. and Wall Paper Manufacturers' deferred units at 25s. were unchanged on balance. Cellon improved slightly to 15s. 3d. British Oil and Cake Mills preferred ordinary units were 6d. lower at 42s., and have lost the improvement recorded a week ago.

Among iron, steel and allied securities sentiment was affected by conflicting views as to the incidence of the A.P.D. proposals. Dorman Long, Guest Keen, Stewarts and Lloyds and a number of shares were, however, firmer, and Tube Investments were inclined to improve following an earlier decline. United Steel were slightly better, and Stanton Iron and Staveley Iron shares had a steadier appearance. Triplex Glass were slightly lower at 37s. 3d. Imperial Smelting were a few pence down at 9s. 9d. The market view is that this year the latter company is likely to be able to bring dividends on the preference shares up-to-date, but that the ordinary shares are unlikely to re-enter the dividend list until 1940.

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In other directions Boots Drug fluctuated moderately, and at 41s. are slightly higher on balance. Beechams Pills 2s. 6d. deferred shares were little changed at 8s. 7½d., the market view being that prospects are not affected very much by the decision not to repeal the medicine stamp duty. Sangers at 21s. were also fairly well maintained, and British Drug Houses remained at 21s. 3d. Timothy Whites and Taylors were 22s. 4½d., compared with 22s. 7½d. a week ago. Monsanto Chemicals 5½ per cent. preference shares were maintained at 21s. 10½d. Blythe Colour Works ordinary at 7s. 6d. and William Blythe ordinary at 6s. were maintained. Borax Consolidated declined to 20s.

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"Shell" and other leading oil shares reflected the day-to-day trend of the Stock Exchange, but Anglo-Iranian became steadier, and subsequently Burmah Oil showed a small improvement. Elsewhere Courtaulds fluctuated moderately, awaiting the interim dividend decision, expected about the middle of July.